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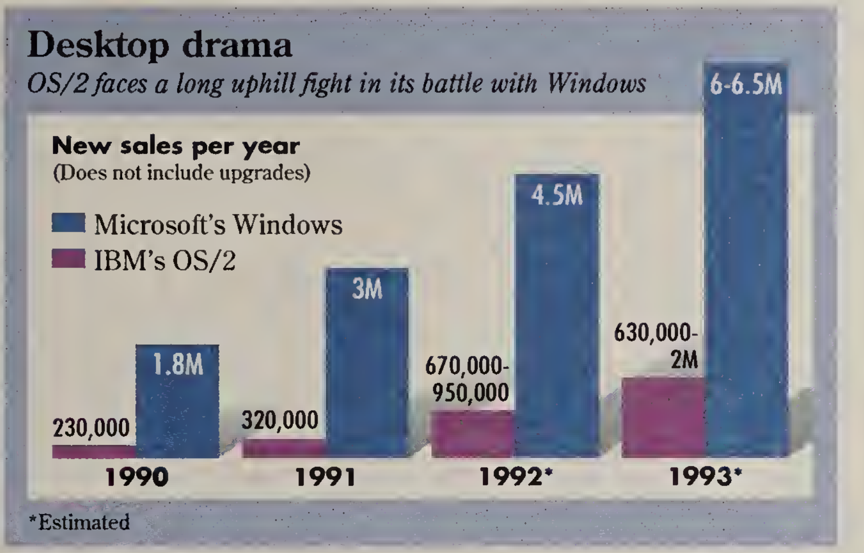
COMPUTERWORLD

Microsoft, IBM strain to deliver wares

String of delays stalls Windows 3.1

BY JAMES DALY
CW STAFF



Source: Gartner Group, Inc.

CW Chart: Marie Haines

What's holding up the arrival of Windows 3.1? Users planning to attend the upcoming third annual Windows & OS/2 Conference in San Jose, Calif., are anxious to find out but are getting few acceptable answers.

What Microsoft Corp. officials originally described as a compilation of minor fixes — a simple fine-tuning of the popular Windows 3.0 graphical environment — has instead turned into a steady string of delays and excuses.

"There are not a lot of cosmetic features that are going to blow people away," said John Stingl, a Windows 3.1 beta-test user and office automation manager at Pacific First Bank in Seattle. Yet so far, Microsoft developers have worked their way through four beta-test releases, cramming in new features and improving clumsy old ones.

The safe money is betting that Version 3.1 will be unveiled at Comdex Spring '92/Windows World in early April, almost a year after Microsoft Chairman Bill Gates announced the first of at least three delivery dates that were later postponed.

The latest deferral came at Comdex/Fall '91 in October, when Microsoft shelved an avowed end-of-the-year ship date, promising instead to have the elusive update available in the first quarter of this year.

"I'd like to see a final version that provides all the functionality they've promised, but I don't expect to anytime soon," said beta-test user Dick Nelson, vice president at New York Life Insurance Co. in New York. Nelson, who recently completed equipping the firm's 10,000 agents with Version 3.0, said the delays will cause the company to stick with Version 3.0 because he does not want to "turn around and start training [employees] on something new."

The unexplained delay has put a crimp in some users' infor-

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Big Blue struggles but hits OS/2 target

BY ROSEMARY HAMILTON
CW STAFF

With only hours to spare, IBM met a crucial deadline last week and shipped a limited-availability version of OS/2 Release 2.0.

However, some customers were concerned that development tools from IBM were not yet updated to work with the limited-availability release, according to discussions on a Compuserve forum last week. An IBM spokesman said there is typically a lag time between release of the operating system and release of development tools. He said the tools should be updated within a few weeks.

"It's sufficient for us to meet our commitments to our users who were expecting this," said George Oliver, manager of information delivery technology at the Royal Bank of Canada in Toronto.

The release, promised in April 1991 and then again in

Continued on page 89

HP station slips under $5,000

BY MARYFRAN JOHNSON
CW STAFF

CHELMSFORD, Mass. — Hewlett-Packard Co. will drop a bombshell on the low end of the Unix workstation market next week with the surprise unveiling of a $4,990 diskless workstation.

In a hastily arranged conference call with analysts last week, an HP executive revised earlier price ranges for the new low-end models of the HP Apollo 9000 Series 700 workstations.

"They're really going to stick it to IBM on the pricing side," said one of the analysts briefed by Gary Eichhorn, a general manager at HP's workstation business unit here.

Price expectations

IBM is expected to announce its new low-end RISC System/6000 during the next few weeks, but few industry observers expect it to be priced much below $7,000. Currently, IBM's lowest priced RS/6000 is the $14,000 Model 320H.

The new low-end Model 705, based on HP's Precision Architecture reduced instruction set computing chip, is a gray-scale configuration performing at roughly 35 Specmarks and equipped with space for additional disk drives.

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- ▶ Holy cow! Hardware revenue expected to grow 4% in 1992. Page 88.
- ▶ Will ACE, OS/2 and SAA wither? One research firm thinks so. Page 88.

Host plans reveal wider options

BY JOHANNA AMBROSIO
CW STAFF

As large information systems shops investigate downsizing, they are finding that answers run in many shades of gray.

All but one of 10 users polled last week on mainframe purchasing plans said they will continue to add high-end horsepower — including upgraded CPUs and more memory and storage devices — during the next 12 to 18 months.

At the same time, however, a majority of those interviewed said they will continue to explore options off the mainframe, including open systems and local-area network servers as well as less expensive alternatives such as used equipment.

In short, users, analysts and vendors predicted the following trends in 1992 and beyond:

- Continued enhancement, particularly in terms of performance, of the installed base.
- Purchasing one large CPU rather than several small mainframes to handle several tasks.
- Changes in the way mainframes are used.

Some users are skeptical about the speculated demise of the mainframe. "If the mainframe is dead, no one's bothered to tell me," said David A. Moore, senior vice president of Mellon Bank Corp. in Pittsburgh.

Mellon installed an IBM Enterprise System/9000 Model 900 — the largest general computer IBM offers — in November 1991 and predicted an 18% growth rate in mainframe CPU hours for 1992. Still, he said,

Continued on page 88

> *"You can't dismiss overnight what it took 25 years to build."*
>
> Elaine R. Bond
> *Senior Vice President, Corporate Systems Group*
> Chase Manhattan Corp.

Photo: Yvonne Hemsey/Gamma-Liaison

INSIDE

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"*If the mainframe is dead, no one's bothered to tell me.*"

DAVID A. MOORE
MELLON BANK

On the much-discussed demise of the mainframe. See story page 1.

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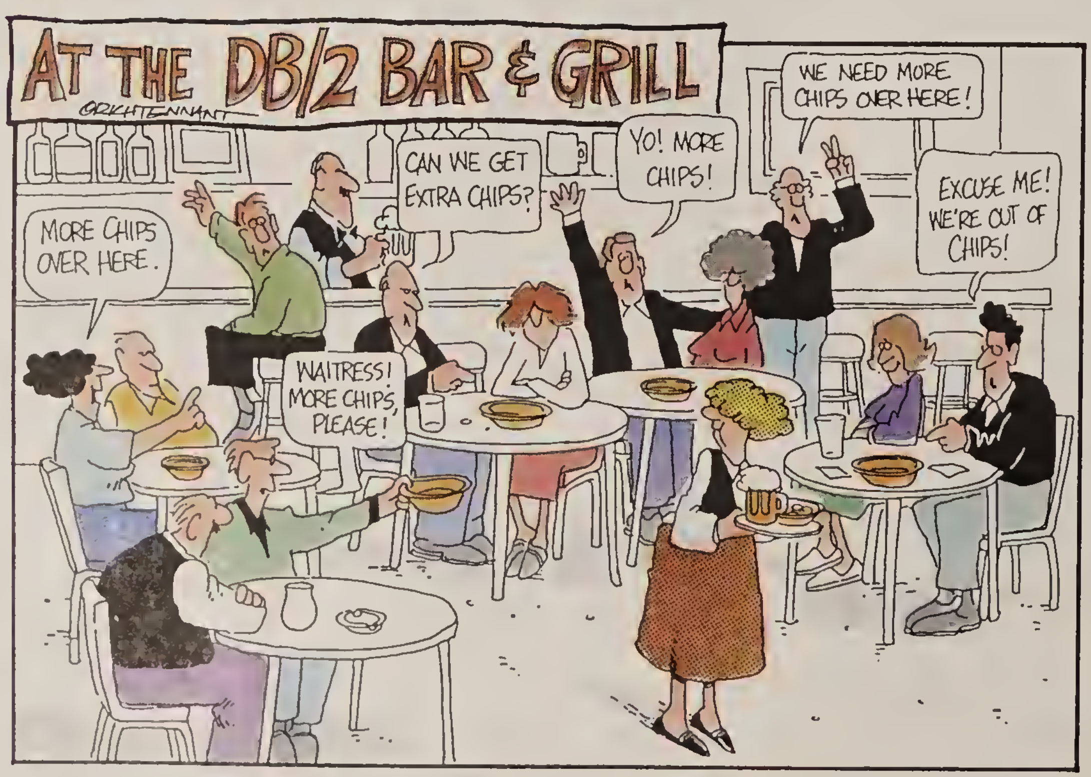

AT THE DB/2 BAR & GRILL
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CAN WE GET EXTRA CHIPS?
YO! MORE CHIPS!
WE NEED MORE CHIPS OVER HERE!
EXCUSE ME! WE'RE OUT OF CHIPS!
WAITRESS! MORE CHIPS, PLEASE!

EXECUTIVE BRIEFING

■ **IBM meets a crucial deadline and ships a preliminary version of OS/2** Release 2.0. IBM had plenty riding on this shipment because of the potential risk to its credibility, analysts say. The release had been promised in April, and then again in October, for delivery by the end of 1991. The final version of Release 2.0 will debut in March. **Page 1.**

■ **U.S. companies jumping on the quality bandwagon** are far more likely to concentrate their efforts on manufacturing or customer service than on information systems. But experts say real quality advances are more probable when companies improve data flow first. **Page 57.**

■ **Good news for the computer industry.** The U.S. Department of Commerce expects that 1992 sales of computer hardware will produce the first real growth in four years. Standard & Poor's says it expects industry profits to jump 12% this year. **Page 88.**

■ **Grace Murray Hopper,** one of the first computer programmers and the mother of Cobol, dies of natural causes on New Year's Day. **Page 14.**

■ **Verimation, an AB Volvo subsidiary, has plans** to extend Memo, its host-based integrated office system, into the local-area network environment through an agreement with Action Technologies, Inc. **Page 4.**

■ **End users are switching their mainframe security software** from Computer Associates' ACF2 and Top Secret to IBM's RACF in part because of greater confidence in IBM's ability to deliver a security solution for distributed computing. **Page 87.**

■ **Tandem Computers has established a strategy for client/server computing,** with an eye on more general applications. **Page 25.**

■ **Blowing a New Year's resolution in 1992 could be suicidal,** says an information systems consultant. He calls 1992 the year in which managers must commit to aligning their organizations with business goals. **Page 55.**

■ **Getting your MBA** does not automatically translate into higher salaries during tough economic times. **Page 74.**

■ **Modular software may find a home on PCs.** Analysts say applications are on the market, and Windows-based software that comes with segments that run alone or can be hooked into other applications will be popular. **Page 37.**

■ **Potential users wait and watch** as Switched Multimegabit Data Service oozes out of the phone companies. Before commiting to using it, telecommunications managers want to know how it differs from options such as frame relay. **Page 49.**

■ **The distributed network management system** announced by Novell last month seems to have some of the features users want. However, it may also be a burden because it is based on the less-than-popular OS/2. **Page 49.**

■ **On site this week:** The Santa Fe Railroad has a wall-size display fed by data drawn from a mainframe and personal computers to monitor the status of trains nationwide. **Page 29.** A new testing and certification system is on tap at the National Association of Securities Dealers. **Page 29.** The results were better than anyone expected when seed developer Northrup King downsized to an IBM Application System/400 and integrated its applications under a common menu system. **Page 31.** Phase 1 of Hyundai Motor America's move to laptop computers brought lighter work loads for administrative staffs, less travel and reduced phone bills because of better use of electronic mail. Phase 2 is now under way. **Page 37.** Central Life Assurance cast an eye to the future when it moved to an imaging system. **Page 41.**

Bob Shepard
Executive Vice President
Information Systems
Kawasaki USA

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Volvo sub takes Action vs. Officevision

BY ELISABETH HORWITT
CW STAFF

Having quietly won several rounds against IBM's office mail systems in the U.S., a Scandinavian office systems vendor is now preparing an assault on IBM's Officevision on both the host and local-area network sides. The potential for users to realize considerable cost savings appears to be a key strategic weapon for Verimation, Inc.

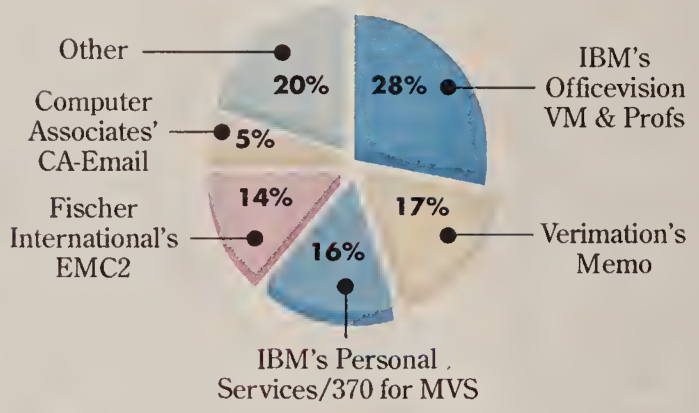
An AB Volvo subsidiary, Verimation is expected next week to announce plans to extend its host-based integrated office system, Memo, beyond IBM mainframes into the LAN environment through a joint development agreement with Action Technologies, Inc.

The partners plan over the longer term to integrate Memo with Action's LAN-based workflow coordination technologies to provide automatic routing of documents across LAN-based and host-based systems corporatewide, according to Adam Sroczynski, president of Verimation's U.S. subsidiary.

Users expressed cautious enthusiasm about Verimation's new alliance with Action. A LAN version of Memo would solve Halliburton Co.'s dilemma of wanting to bring electronic mail to its LAN users without having to maintain two separate E-mail systems — one for LANs and one for hosts, said George MacLawhon, manager of information technology at the Dallas-based energy firm.

"Intelligent routing of forms will become important for 1992 and beyond, as companies get settled with their LAN E-mail systems and look for applications beyond that," said Ann Palermo, director of office systems research at International Data Corp. (IDC).

No postage necessary
Worldwide mainframe electronic-mail software market measured by numbers of mailboxes
(Total: 5.16 million)



Source: International Data Corp.

The company needs to extend Memo to LAN users if it wants to capture a bigger piece of the U.S. integrated office systems market, which together with groupware is projected to grow from about $41 million in 1990 to $320 million in 1995, according to IDC.

While Verimation recently announced gateways to LAN E-mail systems, the deal with Action targets users that only want one E-mail and automated document distribution system running across their host and LAN installations.

While Verimation's U.S. installed base is still comparatively small (3% of 2.77 million domestic mailboxes), the company has recently won some major contracts here, signing up the likes of AMR Corp., McDonald's Corp., Diebold, Inc. and Halliburton — often in a head-to-head competition with IBM.

One of Memo's biggest selling points over IBM products is cost/performance. It costs about $150 per month to run Professional Office System (Profs) on a mainframe and only $6 to $10 per month to run Memo, according to recent report from Gartner Group, Inc. A company with 1,000 E-mail users can conservatively hope to save $3.6 million over a three-year period by choosing Verimation's product, Gartner Group said.

Memo's CPU overhead on Halliburton's 3090 mainframe is so low that the firm's information systems department does not charge its 12,000 to 15,000 E-mail "customers" for unlimited usage, MacLawhon noted.

Halliburton chose Memo over IBM's Disoss, Profs and Personal Services E-mail products about four years ago, finding that the other products "were not user-friendly and [were] expensive to run," MacLawhon said.

Diebold chose Memo over IBM's Officevision, Profs and Disoss packages about six months ago, primarily because of Memo's intelligent forms capability, according to Carl Hossler, manager of software services at the Ohio bank-teller equipment manufacturer.

Host-based office system vendors such as Verimation, Computer Associates International, Inc. and Fischer International Systems Corp. are hoping to "capitalize on the fact that Officevision raised user expectations on what office systems can do and then did not fulfill them," said Mike Anderson, a program director at Gartner Group.

IBM is now shipping a limited LAN version of Officevision, which is not what the vendor eventually hopes to provide, Palermo said. IBM is now working on a more work-group-oriented product with Lotus Development Corp.'s Notes and CC:Mail.

Memo for LANs is scheduled to ship in the third quarter, priced starting at $2,000.

Novell invests in object firm

BY JIM NASH
CW STAFF

SALT LAKE CITY — Novell, Inc. has agreed to invest $700,000 in tiny Serius Corp., a maker of object-oriented development software for Apple Computer, Inc. machines, a spokeswoman for Serius said last week.

Novell will put one yet-to-be determined executive on Serius' board. It expects the partnership to grease the wheels of its network management plans by using object-oriented software and to throw another hurdle in front of competitor Microsoft Corp.'s anticipated Windows New Technology (NT) operating system, according to industry observers [CW, Dec. 2, 1991].

Novell's immediate intention is to see how it can apply the principles of object orientation to its directory services, said a Novell source who requested anonymity. The firm has struggled to produce a naming, or directory, service that includes user addresses and rights for an entire network rather than segments of a companywide network.

Summer plans

Peter Raulerson, president of Paratechnology, Inc., a Bellevue, Wash.-based networking consultancy, said he expects Novell to push for a version of Serius Programmer for its Netware network operating system by midsummer.

He said Novell is in the process of matching virtually every possible advantage Windows NT could offer — in this case, object-oriented software currently lacking in Netware.

Novell, based in Provo, Utah, Crosspoint Venture Partners in Los Altos, Calif., and Intermetrics, Inc. in Boston are putting a total of $2 million into the privately held firm located here, the Serius spokewoman said.

Serius makes Serius Programmer, software that contains 45 distinct application functions. Each of the functions — such as print, spreadsheet, animation and text — is represented by an icon. Developers can drag the icons into the appropriate place in their code, instantly placing a ready-made application.

Raulerson estimated that Serius' annual sales last fiscal year fell just short of $1 million.

"This must be some sort of countermove to the networking threat posed by Windows NT," agreed Brooks Hilliard, president of Phoenix-based consultancy Business Automation, Inc. Both Raulerson and Hilliard said that NT, due in 1993, will likely obviate the need for Microsoft's LAN Manager network operating system.

Sun will soon detail multimedia strategy

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. is expected to soon take the wraps off of multimedia features for its workstations, including enhanced audio, Integrated Services Digital Network (ISDN) capability and video support.

The new features will be anchored by specialized chips added to the Sun workstations' motherboards, according to Sun Chief Executive Officer Scott McNealy. Some of the new and improved multimedia capabilities may be revealed as early as the Uniforum show in San Francisco, which begins on Jan. 22, McNealy said. But he declined to say when the new features — including the special chips — would be generally available or whether they would boost workstation prices.

McNealy conceded at a recent industry seminar that Sun would not be first in the multimedia market but would instead aim to include multimedia capabilities on all shipped Sun workstations. "We don't want to be the first pigeon to take flight over a shooting gallery," he said. "We don't want to be hit first."

Sun's move into multimedia will accelerate in 1992 via software-related anouncements, a Sun spokeswoman said last week, noting the company will offer add-on multimedia capability to standard workstations.

Sun's vision for multimedia includes collaborative applications involving audio, video, telephony, fax, graphics and text. Typical business applications might include groupware, concurrent engineering, in-house training, kiosk information centers in retail stores and medical applications, spokeswoman Liann Lee said.

Sun already supports a smorgasbord of multimedia software, much of it from third-party providers, said David Smith, a senior software analyst at International Data Corp. in Framingham, Mass. "Their direction," he said, "is that all workstations will be multimedia-ready in the future."

But Sun's hardware will not change overnight. "Sun needs to set the stage for future products and to keep the Sun developer camp from getting restless," explained Peter Kastner, a vice president at the Aberdeen Group, a Boston-based market research firm. Kastner said he did not think the add-on chips would significantly add to a Sun workstation's cost.

Third-party software developers are preparing packages to complement Sun's hardware support for multimedia. "We've reached a critical mass in interest in the third-party community, which feels there's a market out there," said Glenn Wichman, a senior software designer at Highland Software in Palo Alto, Calif. Wichman designed the Multimedia Object Manager application development language, which can be used with Sun computers. Sun has been scattering clues about its intentions in the multimedia market for months now, including a demonstration of a videoconferencing application last summer. But pressed by workstation competitors Digital Equipment Corp. and IBM — both of which announced multimedia products last year — Sun has to make its move this year, analysts said.

"The Sun workstation is a very viable multimedia platform, but there are quite a few missing links," said Ajit Kapoor, vice president at Meta Group, Inc.'s image management service in Westport, Conn. Sun's new Solaris operating system must be refined to support full-motion video, including the capture of 30 video-image frames per second, he said.

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Cabletron's edge over Synoptics points up trend toward direct sales

BY JOANIE M. WEXLER
CW STAFF

A revenue shift between ever-dueling smart-hub market leaders Cabletron Systems, Inc. and Synoptics Communications, Inc. indicates a trend in user preferences toward direct sales and support strategies.

Cabletron has finally outdistanced archrival Synoptics in revenue, though the two vendors are splitting hairs over what percentage of Synoptics' income is attributable to managed-hub sales. Analysts chalk up Cabletron's generally outselling Synoptics to Cabletron's direct sales and support strategy.

"Using a direct sales force will position Cabletron well for the next generation of smart hubs," commented Janet L. Hyland, director of network strategy research at Forrester Research, Inc., a consultancy in Cambridge, Mass.

However, Forrester predicted an overall dip in 1992 hub revenue growth (see chart) because of increased price competition.

Dataquest, Inc.'s director and principal networking analyst, Jerry McDowell, agreed that Cabletron's direct approach is largely responsible for the firm's success to date, although he predicted the firm will not be able to continue to afford the overhead in salespeople and follow-up support through 1992.

"If you're maintaining a 40% growth rate and continue to sell product for the same price, performance has to remain high and you must reach a new customer base," he said. "How do you reach that base cost-efficiently with direct sales?"

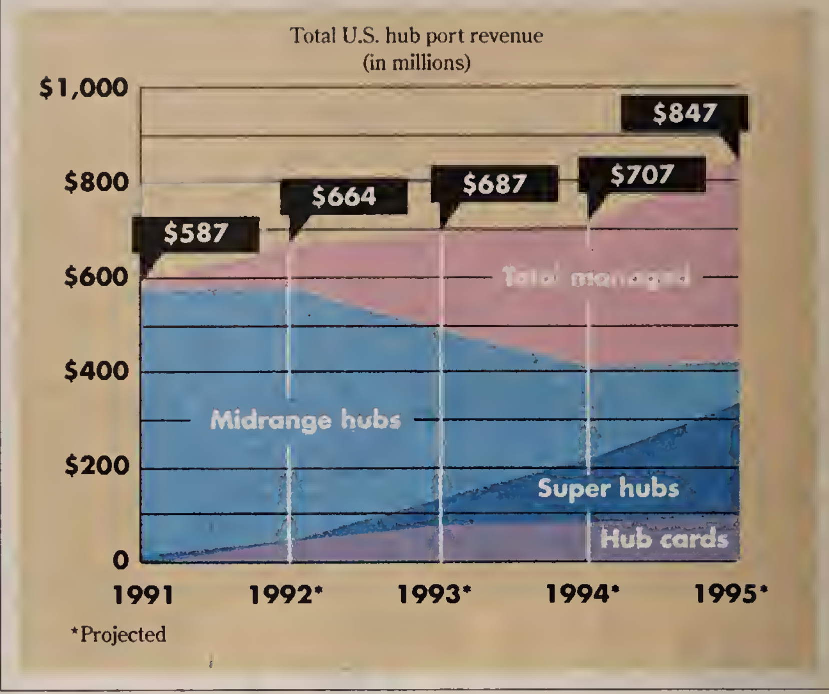
This issue is reflected in the status of Cabletron's Spectrum product, a high-end offering for enterprisewide network management. Cabletron Chairman Craig Benson acknowledged that "we could sell a lot more Spectrum into the market, but we don't have the support, so we're holding back."

Cabletron's nine-month revenue through Nov. 30 was $208 million, compared with Synoptics' $184 million in the same period. In announcing its third-quarter revenue, Cabletron claimed its high-end smart-hub sales accounted for $51.5 million of its $78 million in revenue (66%), contrasted with Synoptics' third-quarter $41.5 million in hub sales on $59 million (70%). However, Synoptics countered that its high-end hub revenue actually accounts for about 90% of its third-quarter revenue.

The release of the initial comparison figures by Cabletron was an odd move, given the firm's 16-month repositioning from smart-hub vendor to network management software firm. Cabletron's network management sales hover between 3% and 4% and are projected to reach almost 14% of the firm's revenue by 1993, according to Needham & Co., an investment analysis firm in New York.

Hub cool down

A sluggish economy and increased price competition could slow smart-hub revenue growth to 13% in 1992, down from 40% in 1991



Source: Forrester Research, Inc.

Proteon pitches hub

While the two smart-hub market leaders duke it out, second-tier vendor Proteon, Inc. is trying to salvage its hub customer base. Proteon recently introduced a $123-per-port, high-end hub designed first to allow IBM-dominant environments to accommodate larger Token Rings, then bundle Ethernets into the same hub.

Dubbed the Series 90, the product is a follow-on to Proteon's intelligent Series 70 Token Ring wiring hub and handles networks larger than 30 nodes. Come midyear, the Series 90 will support two Ethernets alongside the two Token Ring network modules that are now available. Modules for Proteon's bridge/router technology are also slated for mid-1992.

Each hub module can be configured as a stand-alone network or can be integrated into one or several backbone networks, said Vice President of Marketing Nathan Kalowski.

Accompanying Proteon network management announcements will allow Token Ring networks to be managed by IBM's Netview, Digital Equipment Corp.'s Decmcc, AT&T's Accumaster Integrator or Proteon's OS/2 and Simple Network Management Protocol (SNMP)-based Oneview. The network management products are all slated to ship in February.

These moves "allow Proteon back into the market to compete on an even footing," said Bruce Bancroft, northern regional vice president at Trellis, a systems integrator in Hopkinton, Mass., that sells Proteon gear and has also been testing the Series 90 and management products.

Users and analysts agreed on the benefits of a $4,995 SNMP-to-Netview gateway, which translates SNMP messages to Netview formats or Netview to SNMP. A Netview operator does not need to understand SNMP and Transmission Control Protocol/Internet Protocol addressing or vice versa.

"It's like a line at a candy store for beta testers for this gateway," said Bancroft, adding that 25 to 30 firms have shown interest in testing the product during the last three weeks.

"Full translation in both directions will eventually be necessary for everyone," said Jerry McDowell, director and principal network analyst at San Jose, Calif.-based research firm Dataquest, Inc. Currently, Codex Corp. offers a bidirectional gateway to Netview, and one is on the way from Cabletron Systems, Inc.

The Series 90 architecture will accommodate Fiber Distributed Data Interface networks, Kalowski said. But Proteon said it is not planning an FDDI local-area network or an FDDI bridge/router module until market demand heats up.

JOANIE M. WEXLER

Start-up Coral gains 11th-hour financing

BY JOANIE M. WEXLER
CW STAFF

MARLBORO, Mass. — Internetworking start-up Coral Networks, Inc. last week secured $4 million in venture capital amid rumors that it was closing its doors for good.

The 11th-hour financing came from Dallas-based Sevin Rosen Funds and Gibralter Trust in New York. This is the second $4 million investment in Coral made by Sevin Rosen, which teamed with TA Associates and The Bass Trust to provide the firm's initial near-$6 million backing 18 months ago.

Coral has been developing a heavy-duty combination bridge/router/multiplexer aimed at very high-speed local- and wide-area networks. By combining the functionality of products offered by numerous other vendors across a very high-speed backplane, Coral looms as a competitive threat to such internetworking leaders as Cisco Systems, Inc., Wellfleet Communications, Inc. and Network Equipment Technologies, Inc.

Coral's chief financial officer, George McHorney, acknowledged the firm had a "very difficult time" finding financing. The firm cited the sluggish economy and the beta-test status of its product as stumbling blocks. "We were in a no-man's land timing-wise," McHorney said. "With the current economic climate of the venture community, it's difficult to secure financing if you're not a late-stage company."

Sevin Rosen partner Jon Bayless said this is the case for "technology companies across the board." However, he added, the 35% to 40% growth rate of the high-end internetworking market and discussions with the firm's beta-test customers "led us to believe Coral will ship its product at the right time."

Coral had scheduled its switch to ship last summer, said Elaine Jones, vice president of marketing, and it is now targeting March for general availability.

Contributing to slowdown

McHorney and Bayless added that the passing of the firm's presidential baton from David Wagers to John Thibault in June 1991 slowed things down. The transition resulted in a decision not to manufacture the switch in-house.

In addition, "people want to see the new fellow operate for six months" before putting up financing, Bayless said.

The sudden Nov. 22 departure of Frank Bruns, senior vice president of research and development and a Coral founder, was not a condition of the financing, Bayless said. Bruns was reportedly asked to leave.

Coral's Enterprise Broadband Switch is in beta testing at Convex Computer Corp. and other sites. The start-up has been counting on the T3 market, "which has been slow to get to critical mass and is still relatively expensive," observed Rosemary Cochran, principal at Dedham, Mass.-based consultancy Vertical Systems Group.

The March shipping date is probably more in sync with the heavy-duty networking requirements addressed by the switch.

CORRECTIONS

Because of an editing error, a story in the Dec. 16 issue stated that the computer industry is seeking to change the Computer Systems Policy Project (CSPP), a coalition of chief executives from 12 U.S. computer companies. It should have said the CSPP wants to change a federal government program in high-performance computing and communications.

…………

The table of contents in the Dec. 9 issue incorrectly implied that Software AG's client/server strategy is tied exclusively to Microsoft Corp.'s Windows. The open systems plan, as the story points out, supports a variety of databases running on IBM mainframes, Digital Equipment Corp. VAXs and Unix machines. SQL-DB server is an extension to the firm's Entire strategy rather than a new thrust, as the story stated.

…………

Because of a production error, part of the year-end stock table in the Dec. 23, 1991/Jan. 2, 1992 issue of *Computerworld* was incorrect. The "Top Dollar Gainers" for the year are as follows:

Microsoft Corp.	$51.84
Borland Int'l, Inc.	$44.25
Novell, Inc.	$38.00
Xerox Corp.	$30.25
Picturetel Corp.	$29.63

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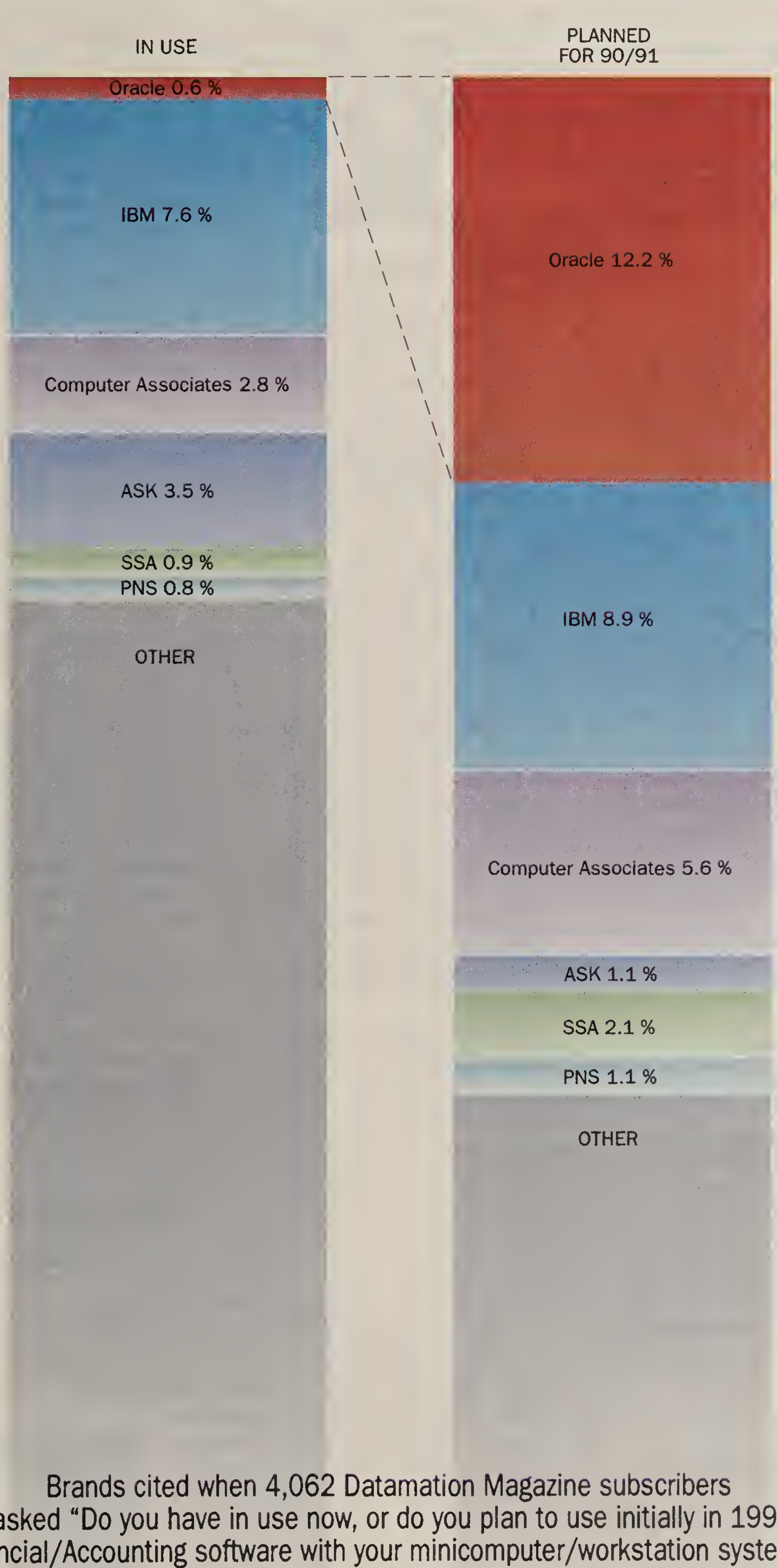

Brands cited when 4,062 Datamation Magazine subscribers were asked "Do you have in use now, or do you plan to use initially in 1990/91, Financial/Accounting software with your minicomputer/workstation system?*

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NEWS SHORTS

Harris lands FAA voice pact

The Federal Aviation Administration (FAA) last week chose Harris Corp. over AT&T for a 15-year, $1.66 billion contract to overhaul the voice communications network for the nation's air traffic control system. The system will initially be deployed at 25 regional facilities and will provide communications between pilots and controllers at the centers that track domestic flights beyond the jurisdiction of local airport towers. It will be built around Harris digital switches, Tandem Computers, Inc. fault-tolerant computers and Magnavox Electronic Systems Co. color touch-screen displays.

……

'Iceberg' cools its heels

Storage Technology Corp.'s large disk array, code-named Iceberg, will go into customer beta-test sites a little later than planned. The firm cited final software refinements and internal testing as the cause of a delay in the beta-test schedule, which has slipped from the first quarter to the second quarter of this year. "We continue to believe we will meet our target of first production shipments at mid-1992, but this puts added pressure on achieving that goal," Ryal R. Poppa, chief executive officer at Storage Tek, said in a written statement. The company will formally announce Iceberg on Jan. 28.

……

DEC to expand chip facilities?

Digital Equipment Corp., based in Maynard, Mass., has confirmed that it is "exploring the opportunity" to build a new semiconductor chip manufacturing plant, according to a company spokeswoman. While no location has been specified, speculation centers on Hudson, Mass., home of DEC's current chip manufacturing facility.

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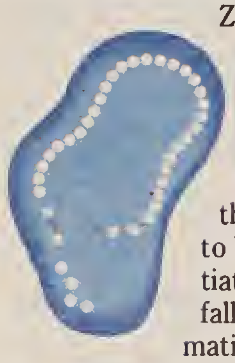
Zale empire loses sparkle



Zale Corp.'s effort to stave off involuntary bankruptcy through a dramatic downsizing of its troubled nationwide retail jewelry empire may endanger its outsourcing pact with IBM subsidiary Integrated Systems Solutions Corp. Signed last June, the 10-year contract, estimated by analysts to be worth $286 million, provides for renegotiation in the event that Zale's total volume falls below a stated level. However, Zale information systems head David Karney said, "That point has not been hit yet." Zale plans to close some 400 of its 2,000 stores, freeze certain payments to creditors and cut its work force by an estimated 20%.

……

Cray Computer stung by delay

The holiday season was less than merry for Cray Computer Corp. after the University of California Lawrence Livermore National Laboratory, Cray's sole customer for its new $30 million Cray 3 supercomputer, decided to give the business to ex-affiliate Cray Research, Inc. Livermore tired of delays for the Cray 3 and exercised a provision in a contract with the two supercomputer companies to buy a C-90 from Cray Research, according to a Cray Computer executive. In a prepared statement, Bill McCurdy, director of Livermore's National Energy Research Supercomputer Center, said another supercomputer was badly needed because "requests for computer time already exceed the center's current resources threefold."

……

Hitachi to resell IBM notebooks

IBM confirmed reports published in Japan that it had reached an OEM agreement with Hitachi Ltd. to supply Hitachi with notebook computers to sell on the Japanese market. A spokesman said the notebooks would be a version of IBM Japan's PS/55note, which runs a Japanese version of DOS. IBM is offering the notebooks as an alternative to NEC Corp.'s proprietary system, which is dominant in Japan. A Japanese newspaper said Hitachi would buy at least 2,000 notebooks a month beginning in April.

More news shorts on page 87

Shrink-wrapped viruses on rise

Experts say software publishers being infected by 'stealth' virus

BY MICHAEL ALEXANDER
CW STAFF

Computers are increasingly being infected by viruses from an unlikely source: mainstream software publishers.

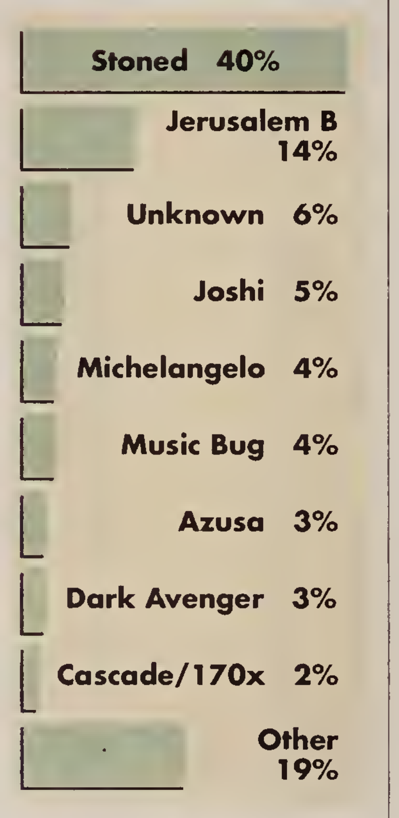
Although hard statistics are unavailable, some experts say so-called shrink-wrapped viruses are among the most prevalent methods of infection.

In the last weeks of 1991, Novell, Inc. was forced to send letters to 3,800 customers warning that the December release of the Network Support Encyclopedia Standard Volume 5¼-in. disk had inadvertently been shipped with the Stoned III virus.

Germ warfare

The Stoned virus was the virus most prevalent in 1991

Percent of incidents reported in 1991
Total: 6,141



Source: McAfee Associates

Stoned III is a relatively new breed of "stealth" virus that is designed to evade detection by traditional antivirus scanning techniques and is often tricky to remove once discovered.

Several recipients of the disks alerted Novell on Dec. 13 after their systems were infected by the virus. There are no reports of damage, according to Novell.

Novell's letter said the virus would infect a personal computer if an infected disk was used to boot the machine but would not infect local-area network servers. The firm also shipped a McAfee Associates virus scanner and cleaning utility that is designed to detect and remove the virus.

In early December, Konami, Inc., a software games publisher, sent a letter to customers warning them that a release of Spacewrecked had been infected with the Stoned virus, an earlier version of Stoned III. Konami said the virus was detected before a large number of copies of the game had been shipped.

The number of infections triggered by shrink-wrapped viruses is mounting, although most software manufacturers routinely screen their products before shipping.

Disks that are shuttled between home and office are the primary source of infection, according to a recent study by the National Computer Security Association in Washington, D.C. In a survey of 600 firms, respondents said 43% of virus infections occurred after employees brought an infected disk to work.

The problem of shrink-wrapped viruses stems from the rapid influx of stealth viruses that has emerged during the past 18 months, said John McAfee, president of McAfee Associates, publisher of the Viruscan antivirus software program. "In the past year, there have been 100 occurrences reported to us of shrink-wrapped viruses on a fairly large scale involving more than 100 diskettes," McAfee said. About half of all viruses — some 200 — introduced in the past six months have been of the stealth variety, he said.

Stoned III is the stealth version of the Stoned virus, discovered several years ago. If left unchecked, the virus can destroy a boot sector or partition tables on a hard disk, causing substantial damage, McAfee said. The virus may cause a pro-marijuana message to appear on the screen.

"Without using a specific scanner that knows how to detect that virus in memory, there are no techniques to detect it," McAfee said. Standard antivirus techniques such as checking for changes in file sizes will not work with stealth viruses, he said.

The National Computer Security Association's study indicates that 9% of infections were caused by viruses on finished products and demonstration disks. This is the first year the study was conducted, and figures for previous years are not available [CW, Nov. 2, 1991].

> THE PROBLEM OF shrink-wrapped viruses stems from the rapid influx of stealth viruses that has emerged during the last 18 months.
>
> JOHN MCAFEE
> MCAFEE ASSOCIATES

Swap meet

About three dozen of the world's top virus trackers are expected to attend an unusual virus swap meet at an upcoming computer security conference.

The event, sponsored by the Antivirus Methods Congress (AMC), will take place during the Fifth International Computer Virus & Security Conference slated to be held March 11-13 in New York.

"Virus researchers routinely swap viruses, but [until now], there hasn't been an organized forum [in which] to do it," said Dick Lefkon, president of the AMC and an information technologies professor at New York University.

The newly established AMC is an industry group that proposes to formalize the exchange of virus information among researchers, antivirus software developers and others who meet certain guidelines. The group has established a credentials committee and plans to limit the swap meet to established virus trackers who are sponsored by members of the AMC's board or by fellow members.

The AMC also has a nonproliferation committee that is in the process of developing controls to limit the accidental dissemination of viruses and to pinpoint the origin of a traded virus should it be released, Lefkon said. The procedures for controlling and tracking viruses will not be made public, to heighten their effectiveness, he added.

MICHAEL ALEXANDER

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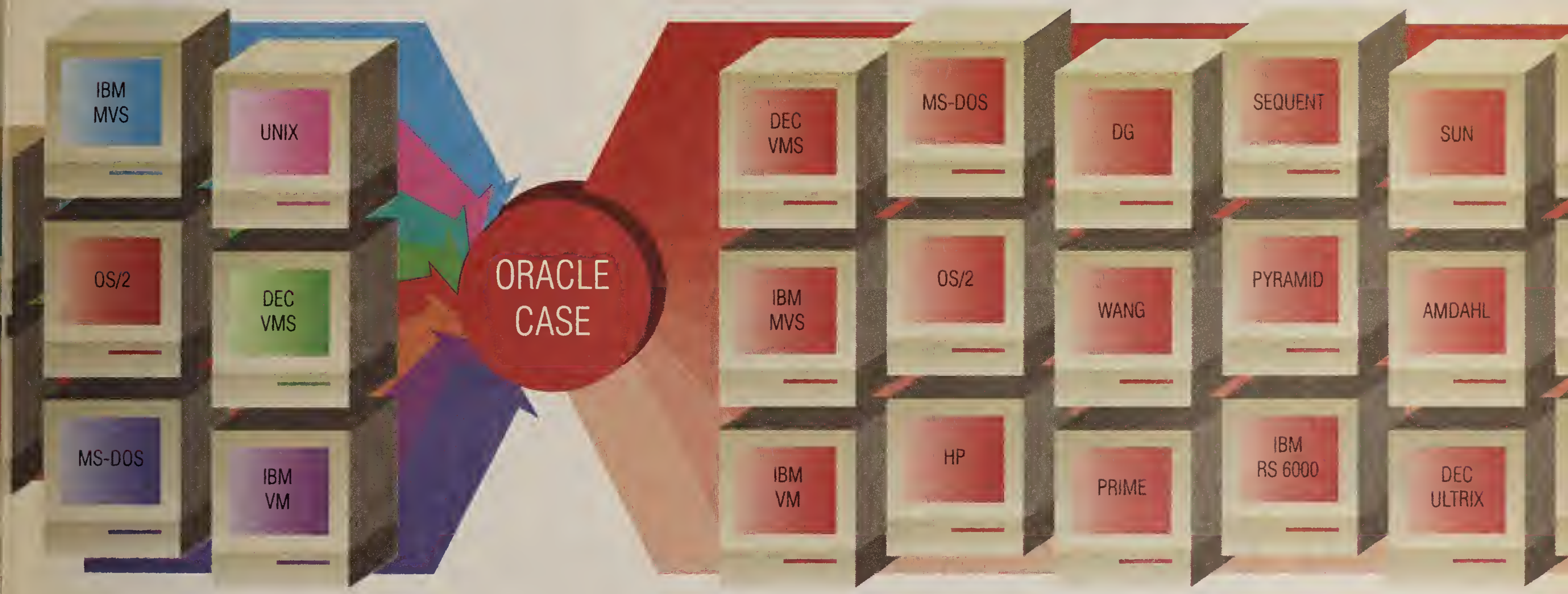

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Industry wary of former Soviet market

BY ELLIS BOOKER
CW STAFF

CHICAGO — With the central government of the former Soviet Union officially out of power, U.S. high-technology firms trying to do business in the region face even more uncertainties than they did just six months ago.

At best, those firms that made bold investments in the former Soviet Union during the rapid thawing of the Cold War probably face a slowdown of buying and joint venture activity while the republics that now constitute what was the Soviet Union sort out their trade policies.

At worst, the time, effort and money these companies spent nurturing relationships with the now-defunct central Soviet government could be swallowed up in chaotic and multiple social, political and economic environments.

For instance, Control Data Corp. in Minneapolis, a company with a long history of deals with the Soviet government, found itself briefly without a customer. Fortunately for CDC, a number of Soviet government agencies have been transferred to the Russian Republic.

"In our case, we were dealing with the larger government entities, and most of these have gone [to the Russian Republic] intact," said James E. Ousley, president of CDC's Computer Products Group.

Esther Dyson, an industry analyst and editor of the "Release 1.0" newsletter, stands by her earlier assessment that the long-range opportunities for U.S. firms are good. "There was and is a tremendous opportunity," she said, noting that the republics that now compose what was the Soviet Union have 280 million people "with a huge need for information technology."

Dyson and companies with Soviet experience emphasize that some of the most fundamental obstacles to doing business in the region predate the breakup of the country.

SPSS, Inc., a maker of statistical software in Chicago, tried and failed to set up a distributor arrangement with a Moscow-based firm. "It went sour after six months. They did not understand the concept of capitalism, of how we do business in the West," an SPSS spokesman said.

Currency problems

An even more serious impediment is the lack of "hard" currency — the ruble is still unconvertible on the world currency exchanges. A number of U.S. software firms have addressed this by selling their product for rubles, rather than dollars, to build both market share and loyalty.

Nantucket Corp., the Los Angeles-based maker of Clipper software, has sold a couple of thousand copies of its application development software in the former Soviet Union during the past 15 months, according to company President Larry Heimendinger. Heimendinger, who says his firm has always emphasized a long-term approach, said he is cautiously optimistic.

"There are no firm, hard principals on how you do things," he said.

Cesare F. Rosati, technical adviser to the deputy assistant secretary for international trade control, said a review of high-technology imports will likely take place in the coming weeks or months.

A silver lining

For software entrepreneur Michael DeLyon, the Soviet Union's dissolution could be a godsend.

"It's like [having] NASA go out of business," he said, referring to the talent in the former Soviet Union that he can now add to his database of 700 Soviet computer scientists and software engineers. DeLyon's Intercontinental Software in Palo Alto, Calif., employs Russian software engineers to build custom computer code.

DeLyon said he can put Soviet workers on a programming job at a fraction of the cost for U.S. workers. "The type of expertise that you'd hire for $75 an hour here, we can provide at $25 per hour there," he said.

Is DeLyon worried about social disruptions? "All we need for our business is a hacker. We need a telephone line, and we need an electric outlet," he said. Knowledgeable, motivated people, he added, is the one export the former Soviet Union can offer the world today.

ELLIS BOOKER

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Grace Hopper, mother of Cobol, dies

Feisty mathematician and Navy admiral, 85, most proud of students

BY MITCH BETTS
CW STAFF

ARLINGTON, Va. — "Amazing Grace" Murray Hopper, one of the first computer programmers and mother of the Cobol programming language for business information systems, died on New Year's Day. She was 85.

Defying skeptics in the 1950s who said computers could only do arithmetic, Hopper developed the Flow-Matic programming language in 1957 for business data processing applications on the classic Univac line of computers from what was then Sperry Corp. Flow-Matic was notable because it used English-like instructions and was the main precursor of Cobol, the most widely used business programming language today.

In the latest of a long string of honors and awards, Hopper received the National Medal of Technology from President Bush last September. She was cited "for her pioneering accomplishments in the development of computer programming languages that simplified computer technology and opened the door to a significantly larger universe of users."

The strong-willed mathematician summed up her philosophy in a 1986 interview: "If it's a good idea, go ahead and do it. It's much easier to apologize than it is to get permission."

She was called "Amazing Grace" by subordinates because of her successful careers in academia, business and the U.S. Navy, her favorite employer. She retired in 1986 as the Navy's oldest officer on active duty, with the rank of rear admiral, and became a senior consultant to Digital Equipment Corp. in Washington, D.C.

Hopper died at her home here just a few weeks after her 85th birthday, DEC announced. The exact cause of death was not reported, but a DEC spokesman said she died of "old age" after a long period of poor health.

No-nonsense opinions

Hopper was often called feisty because of her strong, no-nonsense opinions about data processing. Computer pioneer J. Presper Eckert recalled in an interview last week that Hopper was determined to bring structure and discipline to the art of computer programming.

Eckert praised Hopper for fighting the young computer industry's "Tower of Babel problem" of having multiple, incompatible versions of a programming language. Hopper vigorously promoted standardization of programming languages so they would be hardware-independent.

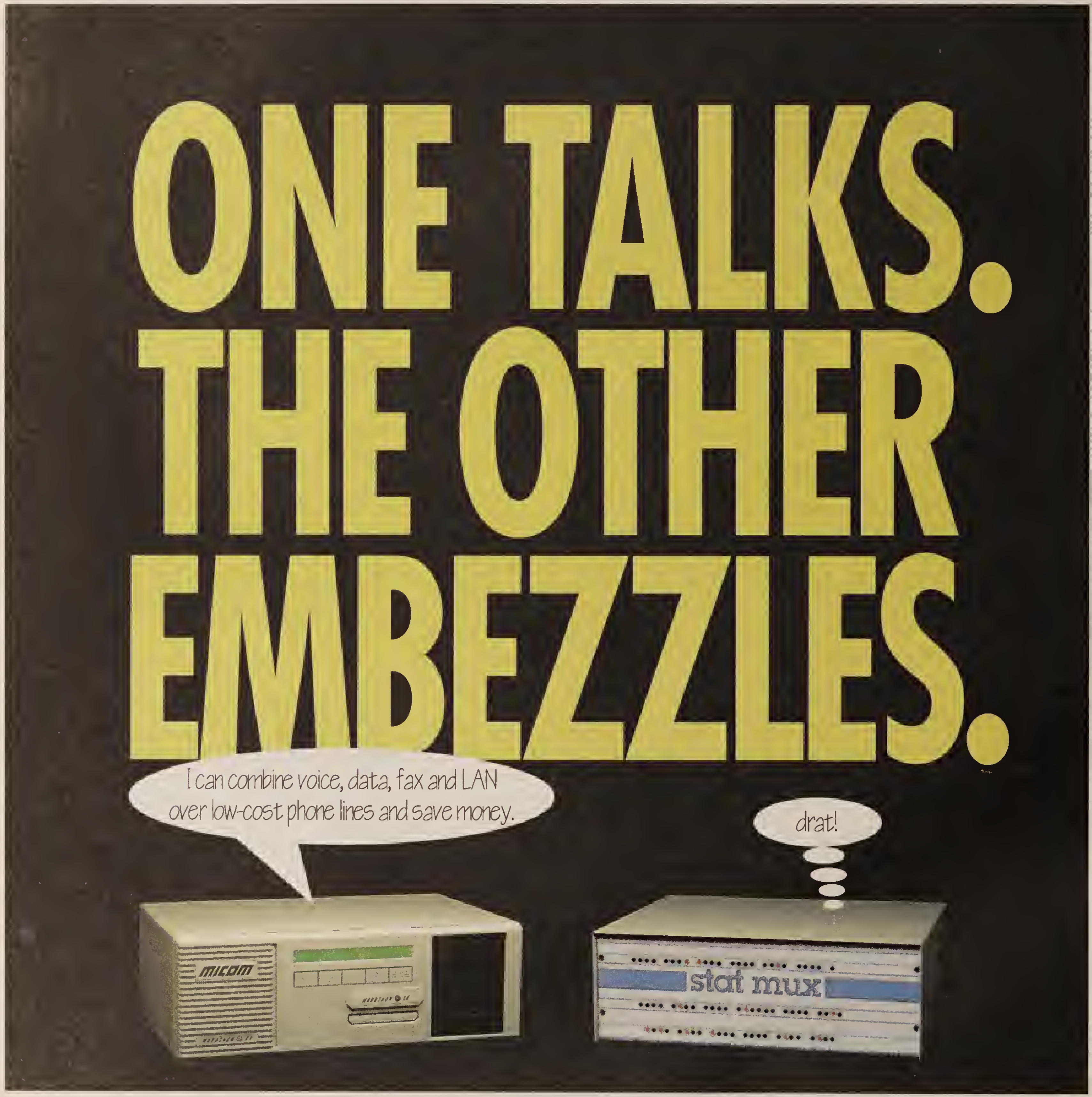
Always fond of gadgets and geometry, Hopper obtained a doctorate in mathematics from Yale University in 1934 and was an associate professor at Vassar College.

In 1943, at age 37, she left academia to join the war effort of the U.S. Naval Reserve. In her first Navy assignment, she was thrust into the nascent world of computing as one of three "coders" for the first large-scale digital computing machine, the Mark I, at Harvard University.

In 1949, she joined Eckert-Mauchly Computer Corp. in Philadelphia as a senior mathematician in charge of programming the Univac I, and she stayed with the company as it was absorbed by Remington Rand and then Sperry. It was during this Univac era that Hopper developed the first compiler in 1952 and Flow-Matic.

Hopper frequently told interviewers that she was most proud of "all of the young people I've trained over the years — that's more important than writing the first compiler."

Although originally retired from the Navy reserve in 1966 because of age, Hopper was recalled within a year to full-time duty to help the Navy standardize its programming languages.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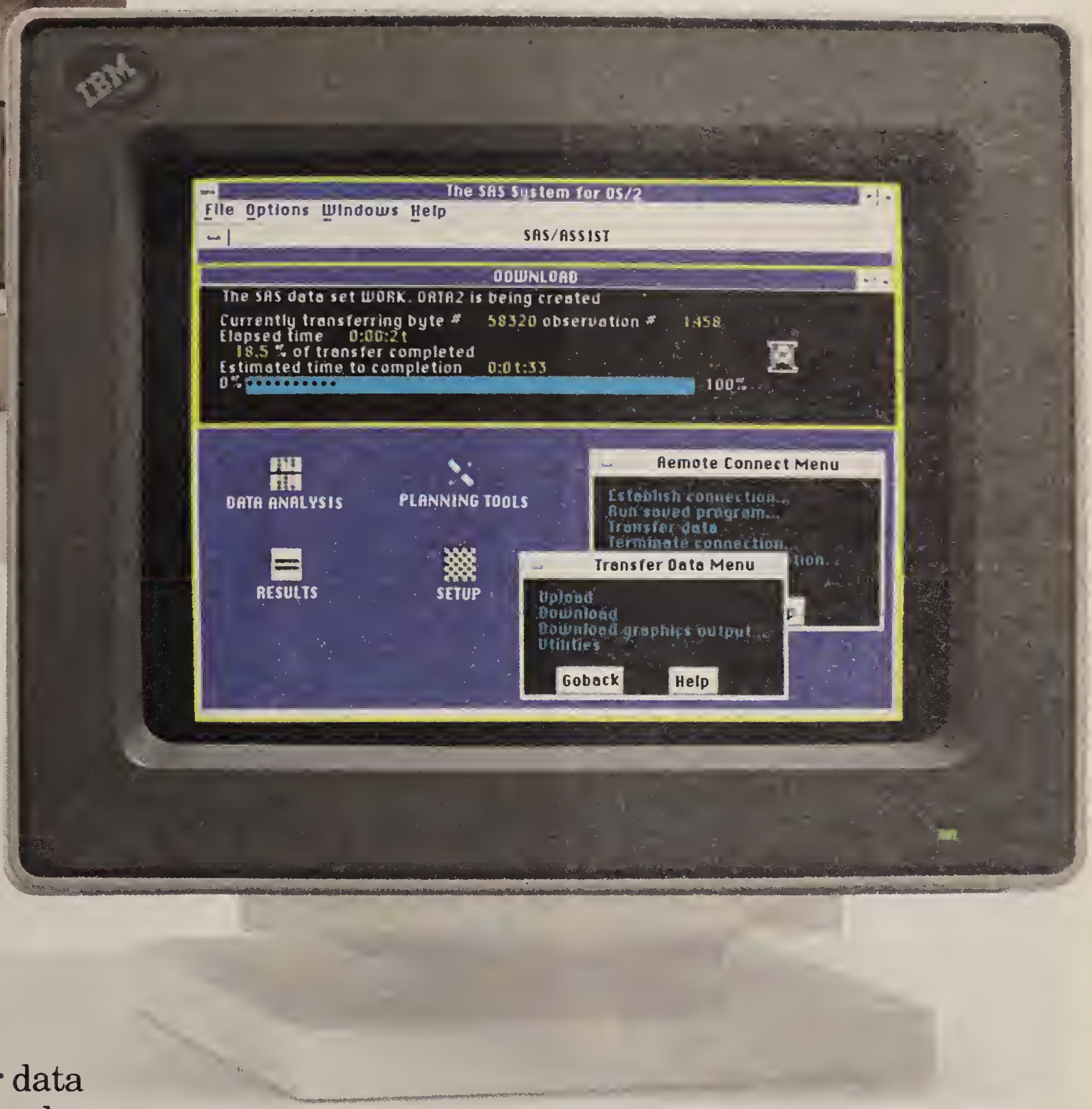

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The SAS data set WORK.DATA2 is being created
Currently transferring byte #    58320 observation #    1458
Elapsed time    0:00:21
  18.5 % of transfer completed
Estimated time to completion    0:01:33
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OSF adds end users to meet open systems challenge

BY MARYFRAN JOHNSON
CW STAFF

CAMBRIDGE, Mass. — The Open Software Foundation (OSF) began its life as a vendor-driven organization, but end users now form the fastest growing segment of its membership, OSF President David Tory said last week.

In 1991, the OSF brought its total membership to more than 300 with the addition of 62 new members, including 23 user companies such as JC Penney Co., Georgia Pacific Corp. and Bell Communications Research. All told, users make up 27% of the membership roster now.

The increased user participation coincides with increasing user pressure on vendors to open up systems and deliver products at a faster pace.

In September 1991, for example, participants in the OSF's End User Forum presented management with a blunt message. "We told them there needs to be a lot more delivery of product," recalled Warren Hoffman, an OSF user member and principal consultant at Du Pont Co.'s Information Systems Division.

"It's great that OSF is doing the Distributed Computing Environment, but we need to see a large number of software suppliers who are going to do it, too. Otherwise, what's the use?

"End users are playing an active role on all the various committees and task forces. OSF is trying to open up their processes to get even more end-user involvement," Hoffman said.

The $25,000 membership fee (discounted for universities and nonprofit groups) entitles members to a regular newsletter and a smorgasbord of groups and task forces to sample.

For example, Boeing Computer Services Co.'s participation in the OSF has meant earlier access to technologies such as the Motif graphical user interface, noted Jim Presti, an IS manager at the firm and chairman of one of the OSF's special interest groups.

Pyramid eyes restructuring

BY KIM S. NASH
CW STAFF

MOUNTAIN VIEW, Calif. — Staff cuts, a corporate reorganization and other expense-paring efforts are in Pyramid Technology Corp.'s immediate future, the company said last week.

These steps were prompted by the midrange systems maker's preannouncement last week of an operating loss for its fiscal 1992 first quarter that it blamed on the worldwide recession.

Tight user budgets also hurt Pyramid during the closing months of last year. About 20% of Pyramid's annual sales comes from regional Bell operating companies, and up to 15% comes from the UK, according to a Pyramid spokesman. Sales from both these segments were down considerably, he said.

The company said it expects a sales drop of "several million dollars" compared with first-quarter 1991's revenue of $56 million, resulting in a loss. Profits for the first quarter of 1991 topped $4.6 million. Official figures for the quarter just ended will not be released until Jan. 21.

Wall Street watchers noted that Pyramid's announcement follows similar events at competitors Sequent Computer Systems, Inc. and Digital Equipment Corp.

A company spokesman declined to provide specifics about the restructuring, saying only that Pyramid aims to reduce spending by $4.5 million per quarter going forward.

That will shrink the company's break-even level, putting it in a good position for the short term, said Shao Wang, an analyst at Smith Barney, Harris Upham & Co. in New York.

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ADVANCED TECHNOLOGY

Combining the methods of 'two separate worlds'

Firms that produce mixed-signal chips for processing analog and digital data find challenges — and profits

BY CLINTON WILDER
CW STAFF

With the growing popularity of multimedia, more analog data in the form of audio and still and moving images is finding its way onto computers. That means a big surge in demand for a type of semiconductor called a mixed-signal chip, which can process both analog and digital data.

The hybrid chips have been around for years, but there are technical barriers to large-scale production of high-quality, fully integrated mixed-signal chips. However, the lucrative potential of applications based on the dual-function chips is prompting several U.S. chip vendors to batter down those barriers.

Design, testing most difficult

Analog-to-digital conversion (and vice versa) is a fairly straightforward process, and it is the key to technologies ranging from telecommunications to disk drives. The technology problems crop up in designing, testing and manufacturing hybrid chips.

The disciplines of design and testing for analog and digital chips have traditionally been two separate worlds, said Jeff Teza, vice president of corporate technology at Brooktree Corp., an emerging San Diego-based maker of mixed-signal chips. "The processes that were optimum for building the best analog chips are not the same for digital," he said. "If you want the best quality analog chips, they tend to be stand-alone."

Alan Levenson

Brooktree's Teza says *the best processes for building analog and digital chips are not the same*

In CMOS technology — the basis of most chip manufacturing today — testing the chip by running signals through the gates of digital circuitry creates disruptive noise. "That's a no-no for precision analog testing," Teza said.

One solution, as practiced by Brooktree and other companies, is to test the digital processing with as little I/O — fewer gates, in other words — as possible. "We have invented a lot of testing methods inside," Teza said. "We protect trade secrets in the test area almost as much as the designs themselves; it's a competitive barrier."

Brooktree has also had to cope with using commercially available computer-aided design (CAD) tools for chip design that have traditionally addressed analog or digital design but not both.

A key to the successful design of high-quality chips is the ability to simulate the performance of prototype chip designs in the CAD software. But most CAD tools for analog design focus their simulations on the transistor level of the chip, while CAD for digital is at what Teza calls "a different level of abstraction" — the actual logic process and gate sequencing.

"In a mixed-signal design, you would like to do very low-level simulations for the digital part, but the overall chip might require a very high-level simulation," he said. "Right now, there is a gap between those two."

Brooktree's solution has been to create its own methodology using different CAD tools, such as logic simulators, circuit simulators and behavioral models. "We have sort of glued it together, using the best tools we could get — whether analog or design — at all levels," he said.

Market to double by '94

Brooktree posted about $85 million in revenue in 1991 selling mixed-signal chips exclusively. The mixed-signal market will top $5 billion this year and will double by 1994, according to VLSI Research, Inc., a chip industry market research firm in San Jose, Calif.

The leaders in the niche are some of the industry's biggest players: National Semiconductor Corp., Philips/Signetics, Inc., Texas Instruments, Inc., Analog Devices, Inc. and Motorola, Inc. Emerging smaller competitors include Brooktree, Crystal Semiconductor (now owned by Cirrus Logic, Inc.) in Austin, Texas, and Sierra Semiconductor Corp. in San Jose.

"The interesting thing is they are all American companies," said Gus Richard, product manager at VLSI.

Debugging 'insect' crawls one step closer

BY MICHAEL ALEXANDER
CW STAFF

Bugs have long been the bane of computers, but at least one researcher believes some bugs could be used to repair computers and to tackle other tasks.

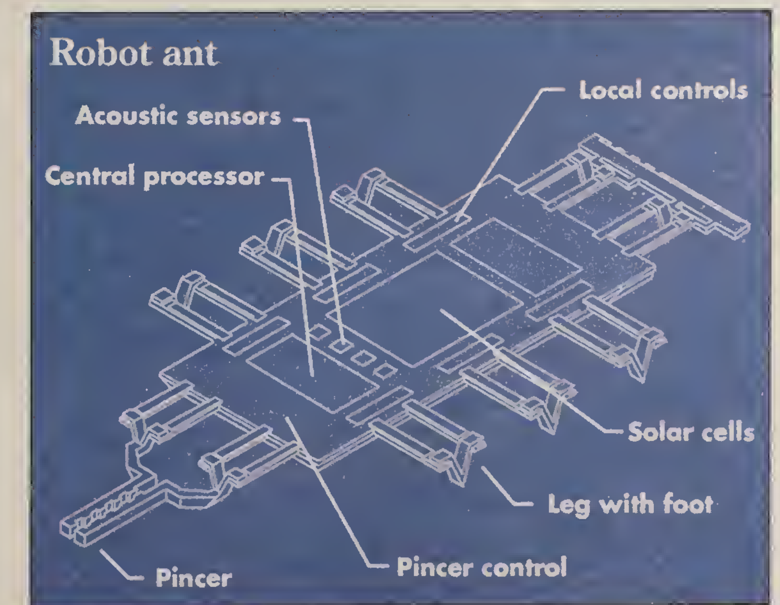
Johannes Smits, an associate professor of electrical engineering at Boston University's College of Engineering, has received a patent for a computerized "silicon ant," a device that is small enough to crawl around the innards of a computer and sophisticated enough to locate and repair defects.

The same silicon ant could be programmed to detect and pick up specks of radioactive dust in a nuclear medicine laboratory, hold human cells for inspection under a microscope or even plant electronic bugs for professional snooping.

The notion of a truly useful silicon ant has been met with "considerable skepticism," Smits acknowledged. "The real applications seem far-fetched," the researcher said. However, other accepted technologies, notably lasers, were invented before their potential applications were fully appreciated, he said.

Smits has not actually built the tiny robot — the first working prototype is about two years away, he estimated. Thus far, he has been able to fabricate the legs that the ant will need to maneuver.

The ant could measure 3 to 7 mm long, depending on its function. A robot equipped with a charge-coupled device, used as an image sensor in video cameras, would be larger than one intended to kill a certain type of crop-damaging insect, for example.



The ant consists of a central processor that serves as its brain, a solar or acoustic cell that provides power, and six pairs of legs.

The ant's legs are actually tiny micromotors that consist of piezoelectric film attached to the top surfaces of a pair of silicon cantilever beams and a V-shaped piece of silicon, which act as feet. Applying small amounts of voltage causes the film to shrink and stretch, thus driving the legs up and down. Alternating the voltage to each beam causes the V to swing back and forth; at the same time, alternating the voltage to each leg causes the ant to scurry forward and backward.

Additional pairs of silicon beams can be attached to the ant's head to act as a pincer or to its tail to act as a tiny saw or other device.

Getting the piezoelectric film in the ant's legs and pincers to stretch and contract predictably is the real breakthrough in designing the ant, said Smits, who is also the director of the engineering department's sensors, actuators and micromechanics laboratory and an expert in piezoelectric technology. The remainder of the ant is readily available or could be easily produced, he added.

Smits calculated that the device would be capable of traveling fast enough to outrun a real bug. It should be able to carry up to 300 times its own weight, according to Smits.

Open systems.

Everyone agrees they’re

No one’s debating whether open systems are a good idea, but you’ll hear plenty of discussion about what open systems *are*.

Some insist, for example, that an open system is a UNIX® system. But to others it’s whatever it takes to get their different operating systems, networking protocols and databases working as one, and the sooner the better.

That’s why IBM views open systems so openly. To us, they begin less with particular technologies and more with the needs of your business.

The real goal is to liberate information that’s trapped around your company, so more of your people can use it more easily, and to open commu-

good, but not everyone agrees how to get there.

nications with customers and suppliers, who no doubt planned their systems without thinking about yours.

And of course, you need to accomplish all this without scrapping your existing multivendor investments.

So the paths to open systems will vary, but there's one thing that won't—consistent industry standards. IBM is fully committed to open systems, so we're equally fervent about standards.

We're active on over 1,200 standards initiatives. We're a sponsor of OSF®, a member of X/OPEN,™ and we support ISO,™ ANSI® and IEEE,™ to name a few. And when a new standard holds promise, we support its development.

What's more, we offer AIX™ for UNIX users and we are improving our SAA™ and AIX systems to work more openly with each other and your non-IBM systems. So as you move to open systems, your investments will be protected. We can also help you open your system with consulting services and technical support.

At IBM, we now measure everything we do—from the desktop on up—against a yardstick of openness. It's what we have to do because it's what you want to do. To get more information, call us at **1 800 IBM-CALL.**

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EDITORIAL

Testimonial

I can clearly recall the first time I heard Grace Murray Hopper speak to a large group. It was 10 years ago, and, as a junior member of this editorial staff, I was assigned to cover her conference presentation.

My expectations were to be bored by an old-timer (she was 75 then) rambling on about computing days past. I learned two things. First, one of the greatest social sins is to prejudge someone solely on age. And second, what a remarkable woman she was!

For a full hour, Grace Hopper held her audience captive in the tender trap of utterly lucid discourse. Her presentation skills were undeniably strong, almost intimidating. Uncanny was her ability to get the crowd focusing on her image of the 1980s and beyond.

She believed the conventions of the past — the Cobol-dominated world she helped foster — would crumble under the weight of a PC revolution that was still years away.

For all her achievements and contributions to the world of information technology, we should remember her words from an interview with us a decade ago when she spoke of her praise for people who "aren't hampered by 'We've always done it this way' or 'It won't work.' "

Us/2

This year — the end of this quarter, in fact — is put-up-or-shut-up time for IBM and OS/2 2.0. And while so much attention has been focused on the importance to IBM of its meeting its stated and implied promises with this product, the spotlight needs to be turned on the customer.

For big IBM sites — and that means many major corporations — OS/2 is a critical part of Systems Application Architecture — the systems blueprint many of these companies have tacitly bought into. So while the corporate computing world of the desktop has been revolving around the Windows-centric universe, some big users are holding out for OS/2 because their major supplier has indicated they should.

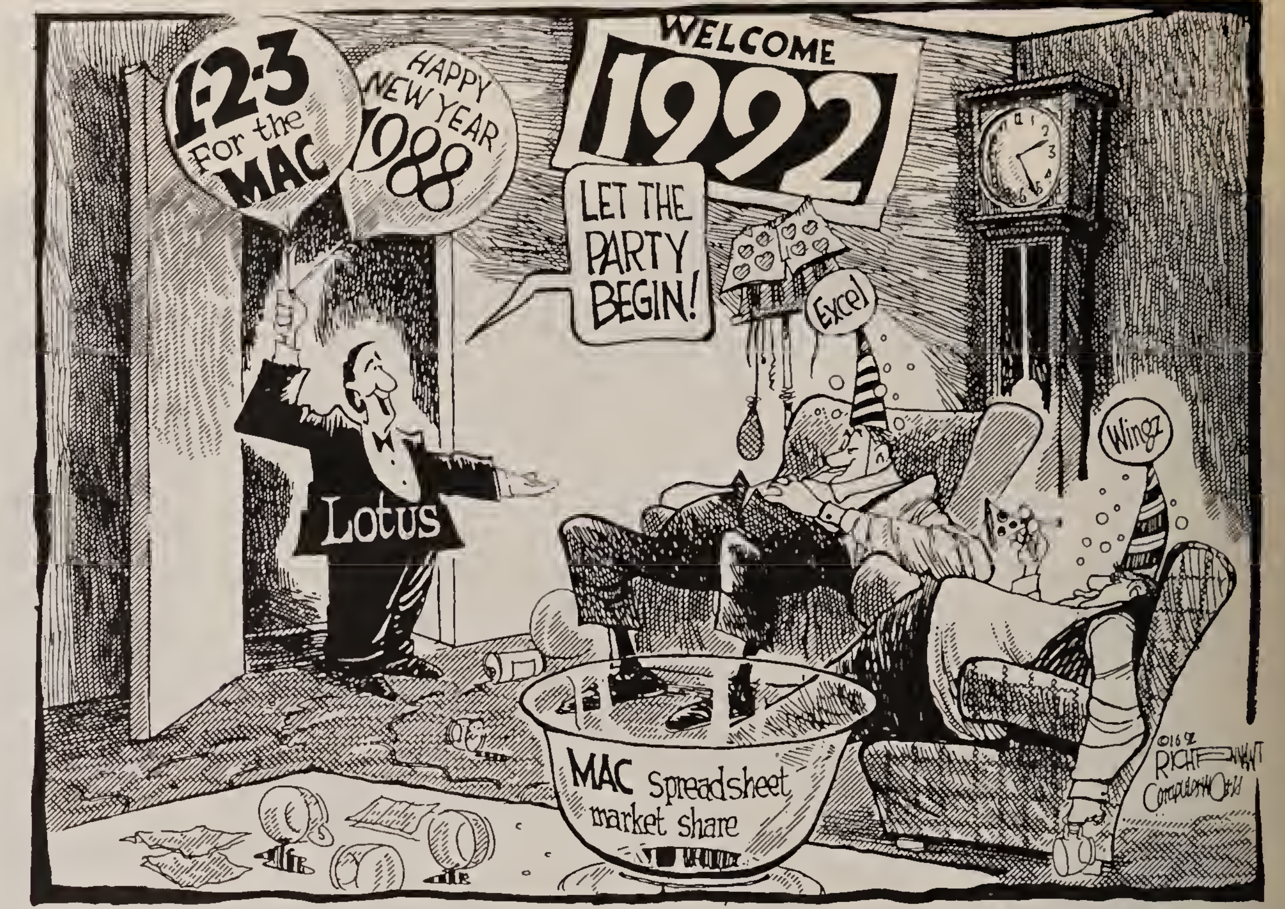
There are many critics and skeptics out there who claim IBM will never incorporate all the promised and desired features into OS/2, and even IBM has as much as admitted that the development process has become woefully complex.

If the company delivers on promises and expectations, that's great. The customer has more choice, and there's greater competition in the vendor community.

But if for some reason the skeptics prove themselves right on this critical technology issue, let's hope IBM thinks of its customers first and doesn't string them along a path that leads to no known destination.

Bill Laberis

Bill Laberis, *Editor in Chief*



LETTERS TO THE EDITOR

DBM class ignored

Regarding "Wave of the future — with a catch" [CW, Dec. 2], I agree with the comments that parallel architectures can be "devilishly hard to program" and that porting serial programs to multiple instruction/multiple data machines is frequently quite difficult.

However, there are at least two major classes of uses of computers that make system-managed concurrency practical.

These two classes are the database management class DBM and the array processing class AP. The DBM class includes retrieval, update, control of logical integrity and authorization control. The AP class includes those cases of engineering and scientific computation in which the same kind of computing has to be executed over large arrays of any dimension.

The DBM class was completely ignored in the article. For the AP class, only the special case of vector processing was discussed.

A fact that should have been noted is that system-managed concurrency is readily achievable for the DBM class if the relational approach is adopted.

E. F. Codd
Menlo Park, Calif.

Author responds

Regarding Harry Miller's Nov. 25 reply to my Viewpoint column, "Don't mess with what isn't yours" [CW, Nov. 4], allow me to clarify several points:

First, the two lawsuits IBM has filed against Comdisco are unrelated, and I did not suggest otherwise in the original article.

Second, concerning the return of parts owned by IBM and IBM Credit, the contract obligations are clearly defined in IBM Credit's Term Lease Master Agreement. Generally, IBM Credit will not accept substitute parts.

As I described in my analogy, if it were my property, I wouldn't want unauthorized parts of questionable ownership installed, qualified by a generality of "like for like."

Finally, the lawsuit filed in Chicago is not over "modified" parts; it is about "counterfeit" parts. It is one thing to sell modified parts, quite another to pass them off as "IBM original" without telling the buyer.

This is a case of customers not getting what they were paying for. Please note: It wasn't until a court order that Comdisco decided to alert affected customers and make restitution on this allegedly illegal activity.

Sam Albert
Sam Albert Associates
Scarsdale, N.Y.

It's Atari's Atari

"Apple stocking antipiracy ammunition" [CW, Dec. 16] includes the following paragraph:

"Commodore Business Machines, Inc.'s Atari ST, for instance, gained such notoriety as a pirate's machine that it eventually became almost impossible to get developers to create applications for it, according to SPA Executive Director Ken Wasch."

You have got to be kidding! The Atari ST is manufactured by Atari Computers, not Commodore Business Machines. Commodore manufactures the Amiga line of computers which has no problem getting developers to write applications.

The Commodore Amiga is the host computer for Newtek's Video Toaster, a product that has had more coverage in noncomputer press than any other personal computer product to date.

Do not confuse the Commodore Amiga with the Atari ST. The Amiga has an installed base of more than 3 million and is far from being the dead-end product the Atari ST is.

Charles E. Hill
Orlando, Fla.

Cutting legal costs

In the Forecast 1992 issue, Joel Gilman wrote about "The Right Ways to Cut Costs," related to legal issues in systems planning and management.

He missed the boat on the single most effective way to cut legal costs and problems — that is, to include an arbitration agreement in every contract you sign. This will, in most cases, drastically reduce the lawyers' fees and the time required to reach settlements. It will also increase the likelihood that someone with some knowledge and interest of the business and fairness issues will make the judgment.

Contact your local chapter of the American Arbitration Association for guidance on how to include the arbitration agreement.

James R. Gard
Durham, N.C.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Workers under surveillance

KAREN NUSSBAUM

Hidden cameras, secret recording of conversations, the undetected viewing of work in progress, minute-by-minute monitoring of the actions of employees — such sinister-sounding measures must surely be reserved for severely troubled workplaces, right?

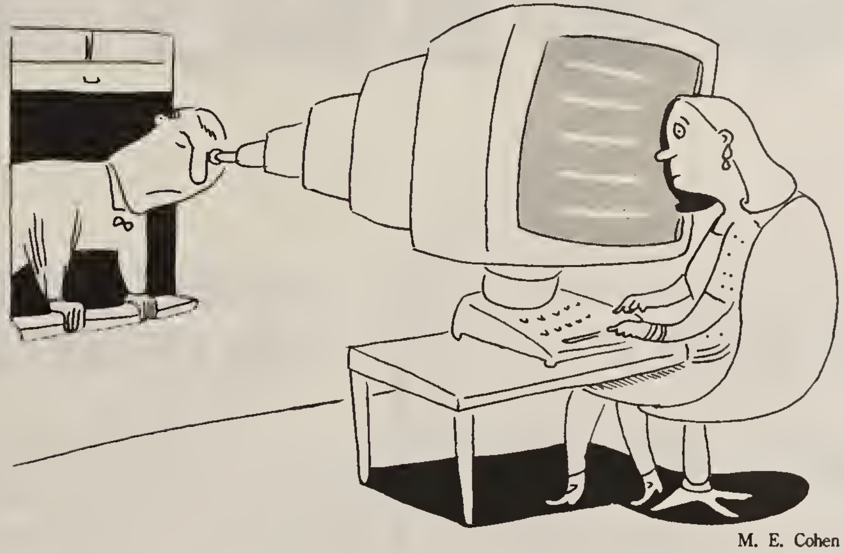
Wrong. Twenty-six million employees nationwide already have their work tracked electronically. Ten million have their work evaluated and their pay based on computer-generated statistics. And new products are constantly emerging to make monitoring of employees easier.

What's even more disturbing is the way these products are marketed — as natural and acceptable tools for management. An ad that appeared some time ago in *PC Week* sticks in my mind. The ad, which was for networking software, boasted that the product "brings a level of control never before possible . . . You decide to look in on Sue's computer screen . . . Sue won't even know you are there!"

Electronic surveillance may be seen by some as a neutral collection of data but, for most workers, it is an invasive management technique that goes far beyond simple supervision.

Often it is not just the work, but the habits of the worker that are monitored. And the power of the technology means monitoring can be, and usually is, constant and disturbingly intrusive.

To understand how this impacts quality of work life, put yourself in the position of a data processor who told me that her screen periodically flashed, "You're not working as fast as the person next to you."



M. E. Cohen

The workers we hear from feel humiliated, harassed and under the gun. Many are also bitter that their work speeds and productivity are publicly posted daily or hourly.

Monitoring is one of a growing list of surveillance techniques used in the workplace. Like drug testing, background data checks, handwriting analysis and "integrity tests," it is seen by management as a means of ensuring employee honesty and productivity.

The problem is, these techniques don't work. Drug tests have up to a 40% error rate. The Office of Technology Assessment found that there is no evidence that integrity tests predict behavior on the job. And most studies show that computer monitoring — at least when employed in the usual fashion — is actually counterproductive. A study that was done last year at the University of Wisconsin, for example, reported that monitored telephone workers suffer significantly high rates of physical and psychological problems.

Workers do need supervision and training. If anything, we now need a greater investment in supervision and training than ever before. Computer monitoring, if used properly, could be a legitimate training aid. Instead, it is usually a poor substitute, the object of which is surveillance and control.

9to5, National Association of Working Women, believes that if monitoring is used, it should be for the purpose of upgrading skills, not to humiliate or browbeat employees. Constructive use of computer monitoring is possible but only with well-established safeguards. We recommend that any company planning to use this kind of technology do the following:

- Notify workers of all surveillance and how it is used, and allow workers complete access to their personnel files.
- Establish grievance procedures to appeal unfairly or incorrectly collected data.
- Establish meaningful standards by collecting work statistics by work group rather than by individual; by barring the use of monitoring results to discipline workers; and by sampling performance periodically, rather than continuously.
- Use employees' input in establishing standards.

9to5 also endorses the Privacy for Workers and Consumer Act (S 516/H.R. 1218), which would protect employee rights of notification and privacy in the modern workplace — basic rights in a complex society.

Nussbaum is executive director of Cleveland-based 9to5, National Association of Working Women. She is also president of District 925, which is the Service Employees International Union.

H.R. 3035: A bill that taxes common sense

DOUG JERGER

Political logic and economic reasoning rarely go hand in hand. Right now, a powerful congressional committee is preparing to prove that point by handing the U.S. software community a bill that taxes common sense.

H.R. 3035 is draft legislation to simplify the tax code on intangible assets. The thought of simplifying tax law is seductive. But, with all due respect to its sponsor, Rep. Dan Rostenkowski (D-Ill.), chairman of the House Ways and Means Committee, H.R. 3035 is a deal that most U.S. software buyers and vendors will prefer to see ditched.

The logic of the bill is no doubt clear to companies that have been forced to battle with the Internal Revenue Service over amortizing as business expenses intangible assets such as goodwill, work-force-in-place and covenants not to compete.

But the bill's logic stumbles by sweeping software into the melange of other intangibles, and it collapses by making the uniform recovery period for software 14 years. Fourteen years!

Only 13 years ago, Dan Bricklin and Visicalc were just getting ready to launch the PC software revolution.

Today, the product isn't sold, and Visicalc gurus, customers and the industry have gone on to other things.

The overwhelming majority of software products make their commercial passage from cradle to grave in five years or less. With this legislation, apparently, old software products will never die; H.R. 3035 puts them in accounting limbo.

Let's get back on a logical track. Software has always been different. For more than 20 years, the Internal Revenue Service has allowed companies to write off the expense of software purchases in five years or fewer.

Several methods exist to determine the value of software when obtained in a product or company acquisition.

H.R. 3035 makes U.S. companies less competitive because the bill makes their investment in software technology more expensive — by 12% to 20%, depending on the mode of acquisition.

Are we really better off making a critical technology less financially attractive to American business? Our international competitors may think so.

Canada, France, Germany, Japan and the UK, among other nations, allow the amortization of software acquisition costs over five years or fewer.

Software has grown to become the largest segment of the U.S. information technology industry. An enlightened tax policy will encourage U.S. companies to acquire more software, not less. That's just common sense.

Systems and software are defining the competitive edge in most major markets. Can lower tech U.S. companies reasonably compete against the Japanese in auto manufacturing? Against the Germans and Japanese in apparel manufacturing? Not for long and not well.

So where's the logic for changing the rules for amortizing software now?

By extending the period for software and other intangibles to 14 years, Rostenkowski seeks to neutralize the negative revenue effects of recognizing new forms of intangible assets.

The approach may put a few new tax benefits on the table for the average business, and that makes sense, especially when our political leaders are desperately seeking measures to kick-start a slumping economy.

But logic that truly serves the national interest must hold up for the long haul.

As an "intangible" asset, software provides tangible benefits to the nation. Now it's time for Congress to make economic sense, too.

Give the economy a much-needed boost by voting business tax benefits for goodwill and the like . . . but not at the expense of the U.S. software industry. Take software out of H.R. 3035.

Jerger is vice president of the American Software Association, a division of the Information Technology Association of America.

HOW DO YOU INTRODUCE THE BIGGEST INNOVATION IN OPE

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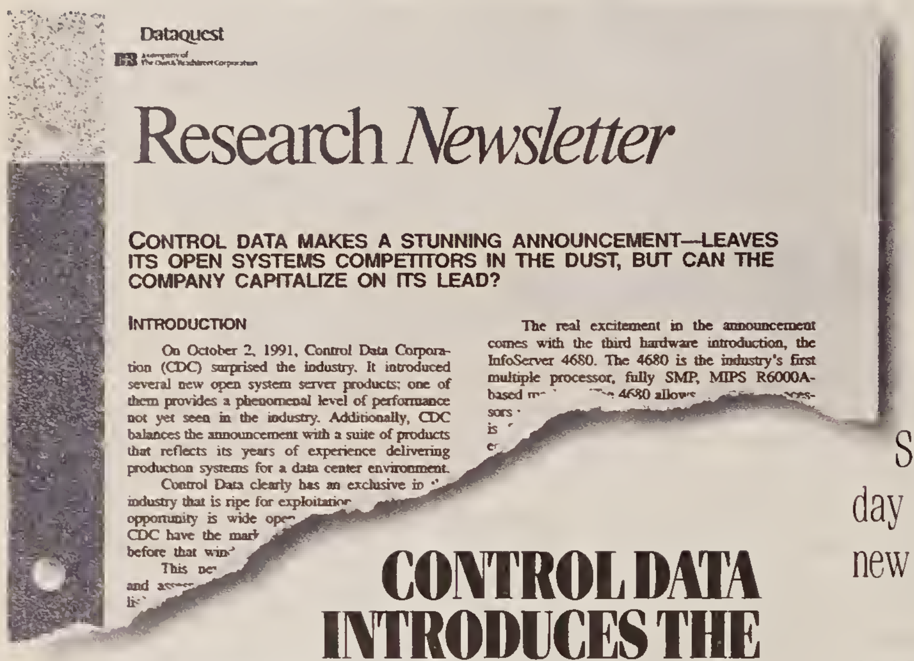

Dataquest

Research *Newsletter*

CONTROL DATA MAKES A STUNNING ANNOUNCEMENT—LEAVES ITS OPEN SYSTEMS COMPETITORS IN THE DUST, BUT CAN THE COMPANY CAPITALIZE ON ITS LEAD?

INTRODUCTION

On October 2, 1991, Control Data Corporation (CDC) surprised the industry. It introduced several new open system server products; one of them provides a phenomenal level of performance not yet seen in the industry. Additionally, CDC balances the announcement with a suite of products that reflects its years of experience delivering production systems for a data center environment.

Control Data clearly has an exclusive in
industry that is ripe for exploitation
opportunity is wide ope
CDC have the mark
before that win

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The real excitement in the announcement comes with the third hardware introduction, the InfoServer 4680. The 4680 is the industry's first multiple processor, fully SMP, MIPS R6000A-based m
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We've got the best open systems superservers. But don't just take our word for it. Take Dataquest's.

CONTROL DATA INTRODUCES THE 4680 INFOSERVER, THE HIGHEST-PERFORMING SUPERSERVER IN THE INDUSTRY.

Excuse us, but we at Control Data really do have the biggest innovation in open systems computing. Not Sun Microsystems. Not Digital. Not any of our competition.

It's called the 4680 InfoServer,™ and it's the industry's first mainframe-class UNIX server. But more importantly, it's *the* fastest, *the* most expandable multiprocessor on the market today. In fact, as industry analysts at Dataquest® report, it delivers "a phenomenal level of performance yet unseen in the industry."

It is, to continue in their words, "a stunning announcement" that "leaves its open systems competitors in the dust."

IT HAS THE BEST OF EVERYTHING.

Its attributes include standards compliance, built-in scalability, network connectivity and truly impressive levels of performance—including the highest SPECthruput number on open systems today (205) and 1381 AIM User Loads—both new world records.

It ensures interoperability with its heterogeneous networking capabilities. It meets any organization's critical security and reliability requirements. And it manages even the most data-intensive environments.

And because it conforms to all major standards, including POSIX (NIST certified), IEEE, ANSI and OSI/GOSIP, applications are easily portable.

In plain English, as Dataquest writes, it "delivers all the requisite attributes that both leaders and niche players in the open systems market boast about."

BUT CONTROL DATA DOESN'T MERELY PROVIDE GREAT HARDWARE.

We provide great solutions, too. As a prime contractor, we've implemented open systems solutions for some of the most complex data-intensive environments in the world.

For example, we helped move the Army Corps of Engineers from a data-processing

Comparison of UNIX-Based RISC Servers

Performance	**CDC 4680**	**DEC 5800**	**HP 750**	**IBM 950**	**SUN 690 MP**
Maximum No. of CPUs	4	4	1	1	4
SPECmark/SPECthruput (Max)	205	39	78	72	91
AIM User Loads	1381[a]	65[b]	*NP*	310	*NP*
TPC-B (Oracle)	112[c]	*NP*	*NP*	*NP*	*NP*
Max. Disk Capacity (GB)	179	58	40	22	52
Standards Compliance					
POSIX Certified UNIX	YES	YES	NO	YES	NO
OSInet Interop. Registration	YES	*NP*	YES	YES	*NP*

[a] With four processors; certified and tested by AIM. [b] With one processor; multiprocessor data not available.
[c] With two processors at a price of $6.3K/tps. NP = Not Published

YSTEMS WHEN EVERYONE ELSE IS MAKING THE SAME CLAIM?

BEST. PERIOD.

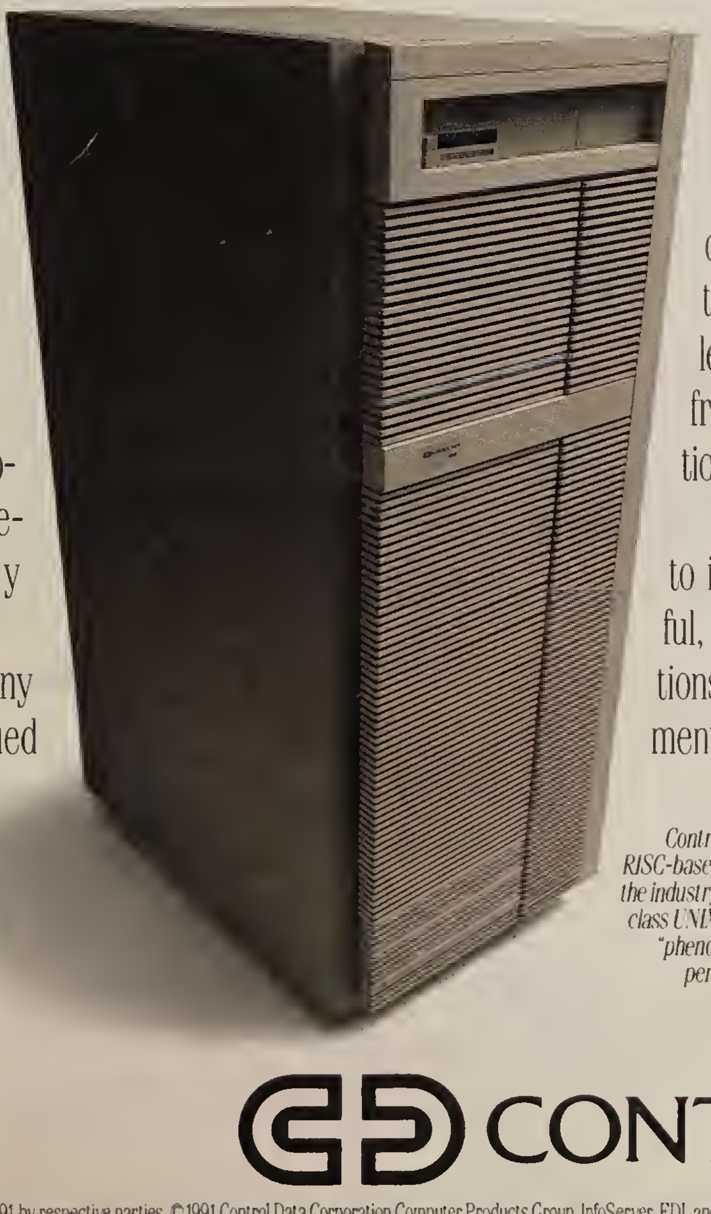
system that allowed for only fragmented communications, to a single highly integrated system that is literally transforming the way they do business.

And, to modernize key aspects of the space shuttle program, we integrated a large number of open systems products for the Flight Analysis and Design System (FADS) program.

In Denmark, FIH (Finance for Danish Industry), highly regarded throughout the financial community for the innovative ways it combines information technology with marketing, chose the InfoServers for an ORACLE client/server environment that integrates open systems technology with over 100 PCs.

Similarly, when Canada's Digitech Information Services, Ltd. needed to migrate its petroleum information database from an antiquated mainframe environment to an open systems alternative, they chose us because we were the only supplier who had implemented the necessary enhancements.

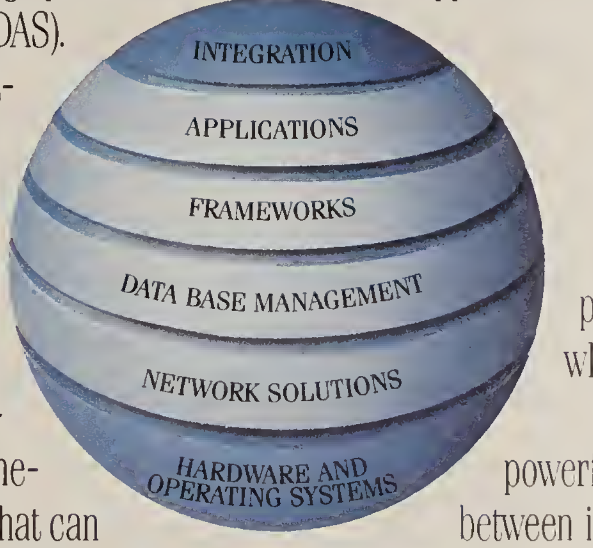
In fact, no company is more uniquely qualified to provide open systems solutions than we are.



Control Data's new RISC-based 4680 InfoServer, the industry's first mainframe-class UNIX server, delivers a "phenomenal level of performance."

We have the hardware—including our 4000 InfoServers and our high performance disk array subsystem (DAS).

We have the operating software and sophisticated networking capabilities. Including FDDI, DECnet, and SNA connectivity, and a complete set of OSI networking capabilities; EDL™, a powerful framework and networking tool that can get an organization working together like it's never worked together before; AWBUS,™ our automated workstation backup system that virtually eliminates lost data for networks of UNIX workstations; and ICEM,™ our suite of CAD/CAM software that allows for a seamless flow of information from geometry generation to NC programming.



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And we have the worldwide service and support to back it all up.

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Solutions that are unparalleled at organizing overwhelming amounts of data.

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Solutions that, in the end, give an organization the flexibility and power it needs to not only survive, but thrive in a volatile and competitive business climate.

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Let us show you why, if you want the best open systems solutions and you want them now, we're the people to call. Period.

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You may not even know what pen computing is or what it can do for your organization. Experts* predict that *Fortune 1000* companies collectively will be saving hundreds of millions of dollars in data-entry costs alone through pen computing by 1995, not to mention improvements in customer service, field sales, inventory reporting, medical record keeping, and claims adjusting, to name a few applications.

To better understand how to apply pen computing to the challenges facing your organization, come to the first *Pen Computer Users Conference* for prospective users. Managers who are using pen computing today in organizations like yours will discuss how they gained the acceptance of upper management and end-users, and developed software. The major pen computer systems available today will be demonstrated.

The Pen Computer Users Conference has been guided by **The National Advisory Council on Pen Computing**, whose members will speak at the conference.

- ▶ Portia Isaacson, Ph.D., Dream Machine
- ▶ Andrew Seybold, Dataquest
- ▶ Bill Lempesis, The Lempesis Report/Pen Vision News
- ▶ Tim Bajarin, Creative Strategies Research International
- ▶ Peter Tiege, Infocorp
- ▶ Bruce Stephen, International Data Corporation

Other industry experts will speak including **John Rizzo** of **Momenta**, **Pradeep Singh** of **Microsoft**, **Chuck Ennis** of **TelePad**, **Jeff Hawkins** of **GRiD**, **David Fox** of **Nestor**, and **Harry Gierhart** of **OCR Systems**.

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- ▶ Gaining User Acceptance
- ▶ Pen Computing's Return on Investment
- ▶ Demonstrating Advantages to Management
- ▶ Handwriting Recognition Applications
- ▶ Pen-Top Computers
- ▶ Wireless Communication via Handheld Pen Systems
- ▶ Palmtop Computers and Pens

Register now or call for more information on pen computing. Be sure to ask about the conference transcript available on interactive diskette. (800) 729-3660.

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*Pen Vision News/Lempesis Report

Federal Computer Week is the official government publication of the *Pen Computer Users Conference.*

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You wanted it, you got it.

Introducing the Dell® 486P/20. A computer that gives you an i486™ SX processor at the price of an i386™ DX machine.

An incredible performance boost of up to 40% at virtually no additional cost.

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Generating enough processing power to exploit the full potential of future versions of Microsoft® Windows™ and OS/2®.

Making whatever software you run, run that much faster.

Giving you quicker recalcs, database compiles and screen refreshes.

In short, getting rid of excess wait.

And if that isn't impressive enough, the Dell 486P/20 comes with an upgradeable processor that can go from a 20 MHz i486SX chip all the way up to a high-end 33 MHz i486DX system, and even beyond.

Which, considering that we're talking about a computer under $2,000, is nothing short of revolutionary.

A true power user's desktop. For its low price, the Dell 486P/20 has a lot of technical innovations you wouldn't expect to find on even higher end machines. Things like programmable Flash EPROMs, for example, that make conventional methods of upgrading system BIOS seem almost obsolete. You won't have to take this computer apart and lose your patience trying to pry out a reluctant chip. Just slip in a diskette—that's all.

Expanding memory is equally convenient. One of the few PCs to support 16 MB SIMMs, the 486P/20 carries 4 memory expansion sockets, on its main board. So as your needs grow, you can keep adding RAM in 1, 4, or 16 MB increments up to a total of 64 MB. That's plenty of room to run your networking software, Microsoft Windows and just about any high-performance graphics application.

And talking about graphics, a small expansion of video memory to 1 MB (512K is standard) will put over *32,000 colors* at your disposal, letting you create images that approach photographic quality.

The 486P/20 also makes those images a lot easier on your eyes. It supports up to 1024 x 768 non-interlaced video at a fast 70 Hz refresh rate for a flicker-free display. Unlike the kind you get on some competitive machines that are limited to 60 Hz non-interlaced.

An i486SX processor with the future built in. Because the Dell 486P/20 upgrades via a processor chip instead of traditional processor cards, upgrading takes the form of a single, economical step:

Just remove one chip and replace it with a higher performance version.

On the other hand, if you never need to upgrade at all, you don't end up having paid a price penalty to get the system in the first place. Either way, you win.

Apart from the processor, the 486P/20 is also designed to allow easy upgrading of hard disks, memory and video capability. So when your needs change, the rest of your computer can, too.

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THE DELL 486P/20 20 MHz i486SX SYSTEM.*
SYSTEM INCLUDES 50 MB HARD DRIVE, VGA COLOR MONITOR, AND 2 MB RAM.

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If your requirements call for a more powerful or specialized system than the one we've just mentioned, here's an amazing fact: feature for feature, you can get an even *better* deal with our higher-end i486 systems. From $248 all the way up to a whopping $1,348, your savings increase with the sophistication of the Dell System® you buy. So go ahead, read on. And if you still have any doubts, call us. We'll be happy to explain how the more our i486 systems cost, the less they actually cost.

MORE VALUE

The Dell 486P/20 is a 20 MHz i486SX general purpose workstation you can upgrade to 33 MHz and beyond.

For a configuration that costs so little, you sure get a lot.

Like programmable Flash EPROMs for easy BIOS upgradeability.

And an 80 MB hard disk drive with 15 ms access time.

And an 8 KB cache built into the processor for increased throughput.

And 4 MB of RAM on 32-bit SIMMs with gold-plated connectors for greater reliability.

And 2 floppy drives.

Surprised? Keep reading.

You'll also get a 1024 x 768 14" color monitor with long persistence phosphors.

And the power to display 32,000 colors simultaneously, if you expand video memory to 1 MB.

And factory-installed MS-DOS® 5.0 and Microsoft Windows 3.0.

And a Microsoft Mouse.

And, considering it's from Dell, a whole lot of peace of mind.

That, by itself, is worth a fortune.

THE DELL 486P/20 20 MHz i486SX SYSTEM.☆
SYSTEM INCLUDES 80 MB HARD DRIVE, SUPER VGA (1024 x 768) COLOR MONITOR,
5.25" 1.2 MB AND 3.5" 1.44 MB FLOPPY DRIVES AND 4 MB RAM.
SAVE $248▽

MORE PRODUCTIVITY

The Dell 486D/25 is a sophisticated productivity workstation that was designed with your future in mind. To upgrade from a 25 MHz i486SX processor to a faster processor when available, all you'll need to do is replace a processor chip. Not a card. And starting with 4 MB, you can keep adding RAM up to a maximum of 64 MB.

This new system is priced on par with 33 MHz i386DX machines, yet performs up to 40% faster. And its sheer processing power is amply backed by a 100 MB hard drive with a 32 KB cache for increased throughput. A dual floppy drive completes the excellent storage arrangement.

A 1024 x 768 14" color monitor with a 70 Hz refresh rate gives you a flicker-free display. With 32,000 colors, if you make a small expansion of video RAM. Should anything go wrong, the built-in SmartVu™ diagnostic display can find the problem, even if the monitor goes down.

The 486D/25 comes with six expansion slots and five drive bays for added flexibility. You'll also get factory-loaded MS-DOS 5.0, Microsoft Windows 3.0 and a Microsoft Mouse.

THE DELL 486D/25 25 MHz i486SX SYSTEM.☆
SYSTEM INCLUDES 100 MB HARD DRIVE, ULTRASCAN™ 14C MONITOR,
5.25" 1.2 MB AND 3.5" 1.44 MB FLOPPY DRIVES AND 4 MB RAM.
SAVE $748▽

MORE SPEED

From desktop publishing to spreadsheet applications, there's one feature that's always welcome, and that's speed. With quick recalcs and lightning fast screen refreshes, you'll get your work done faster with the Dell 486P/33.

The 33MHz i486DX processor generates up to 80% more performance than 33MHz i386DX systems. If that leaves you craving for more, you can upgrade to a faster i486 processor when available.

This 486P/33 configuration features a 100 MB hard drive with a phenomenal 15 ms average access time. An 8 KB cache in the processor boosts performance. And dual floppy drives allow you to read any diskette, regardless of MS-DOS format.

A 1024 x 768 non-interlaced big 15" color monitor with overscan gives you 30% more viewable area than the standard 14" you get with any competitively priced system. For even more versatility on desktop publishing or graphic-intensive applications, just expand video RAM to 1 MB and you'll get a 32,000 color, near-photograph quality display.

The system comes with 4 MB RAM on 32-bit SIMMs with gold-plated connectors, MS-DOS 5.0, Microsoft Windows 3.0 and a Microsoft Mouse.

THE DELL 486P/33 33 MHz i486DX SYSTEM.☆
SYSTEM INCLUDES 100 MB HARD DRIVE, ULTRASCAN 15C MONITOR,
5.25" 1.2 MB AND 3.5" 1.44 MB FLOPPY DRIVES AND 4 MB RAM.
SAVE $948▽

MORE GRAPHICS

The Dell 486D/33 has every high-end feature you'd expect in an outstanding graphics workstation. Except a high-end price tag.

There's a superfast 33 MHz i486DX processor, with 8 KB internal cache. For even greater performance, all you'll need to do is replace a processor chip. So you can upgrade inexpensively as soon as new chips hit the market.

Should your workload, heaven forbid, triple by then, you'll still find the 200 MB hard disk more than adequate.

And as your requirements become increasingly more sophisticated, you can keep adding to the 486D/33's 8 MB RAM. With a maximum of 64 MB, there's plenty of room to grow.

Talking about room, we have a large 15" flat square monitor with 30% more viewable area than a standard 14" monitor, which makes those large spreadsheets and high resolution documents much easier to read.

The Dell 486D/33 comes with factory-loaded MS-DOS 5.0, Microsoft Windows 3.0 and a Microsoft Mouse.

intel inside®

THE DELL 486D/33 33 MHz i486DX SYSTEM.☆
SYSTEM INCLUDES 200 MB HARD DRIVE, ULTRASCAN (1024 x 768) 15C MONITOR,
5.25" 1.2 MB and 3.5" 1.44 MB FLOPPY DRIVES AND 8 MB RAM.
SAVE $1,348▽

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Gold-plated SIMMs increase system reliability by eliminating connection-related errors.

There are plenty of companies anxious to sell i486 systems at a low price. All they really need is a supply of parts (the cheaper, the better) and a garage to assemble them in. Once the "production line" gets going, they place a few ads in the paper. After that, of course, it's anyone's guess as to which will last longer: the computer or the "company" it came from.

The 486P/20 is one of the few computers to feature 16 MB SIMMs.

At Dell, on the other hand, we offer lower prices by cutting down on traditional retailer mark-ups, not quality. In fact, we're almost fanatical about the quality of every machine that leaves our state-of-the-art factory. That attitude is reflected in the way we design, test, manufacture and ship our i486 systems.

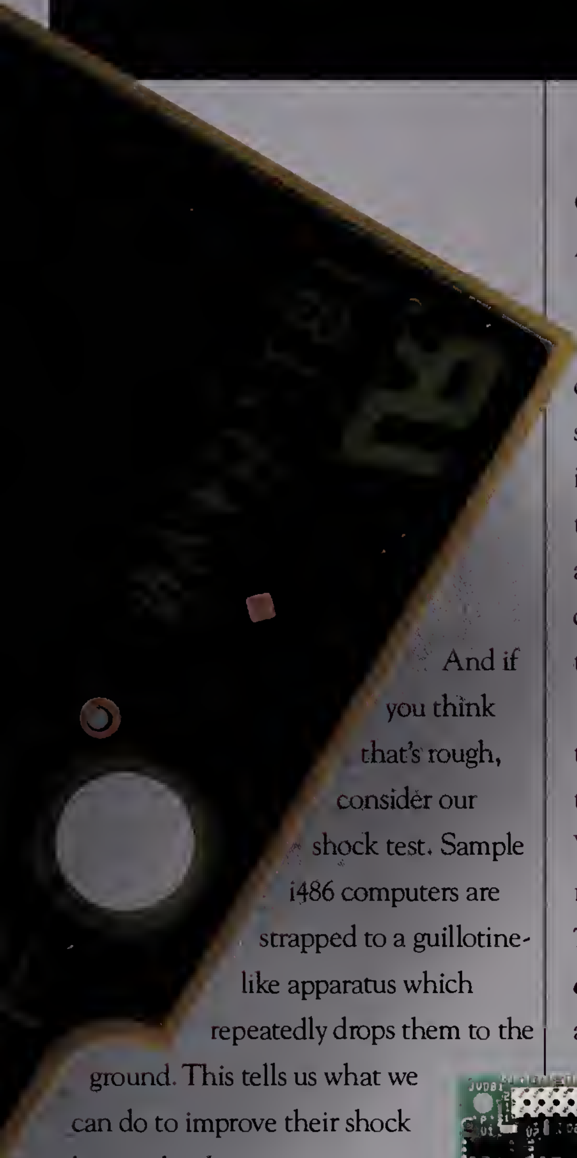
To see how our i486 systems stand up to air delivery, we use a Black Box. Or, in technical parlance, a portable accelerometer/thermometer. This little device is fitted into a test computer which we then send out through regular delivery channels, much as if you had ordered it yourself. When we bring it back, the "Black Box" tells us exactly what the computer went through, in terms of shock, vibration and temperature. This innovative test is part of a series that's been so successful in helping us improve our packaging, we've won an international award for package design.

Our Black Box test makes sure your Dell computer never arrives this way.

To make our computers more reliable, we cook them. After our computers are fully assembled and configured, randomly selected units are "burned-in" and tested at 104°F.

In perhaps the most grueling temperature test we've ever come up with, pilot Dell systems must survive a storage chamber where temperatures vary rapidly between −40°C and +60°C.

JUST BECAUSE YOU PAY LESS DOESN'T MEAN YOU GET LESS.



Our computers have a heart of gold. At Dell, we take quality consciousness so seriously, we fit our i486 systems with SIMMs that have gold-plated connectors. If you're wondering what such expensive components are doing in relatively inexpensive computers, the answer is simple: they cost us a bit more, but by eliminating connection-related errors, they're worth their weight in gold.

It's exactly this kind of commitment to quality control that's enabled us to meet CSA, UL, TUV-GS, FCC and VDE standards, earning worldwide regulatory approvals.

There are thousands of ways to use a Dell i486 system. Dell i486 systems are tested for compatibility with major peripherals, software applications, network topologies and network operating systems, including Banyan and Novell, in several hundred permutations per system. They're even tested for AS-400 connectivity. So you can use our machines in virtually any environment.

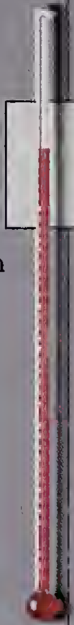
50% fewer opportunities for things to go wrong. After the traditional computer manufacturer builds a system, it goes to the dealer, who then does his own configuring. That's 2 stages of manufacturing, which means twice as many opportunities for things to go wrong.

A Dell i486 system, on the other hand, is manufactured only once. We custom-configure memory boards, network cards and advanced video, testing the system as a unit.

We even load select software packages you buy from us, at no cost to you. That includes MS-DOS 5.0, Microsoft Windows 3.0, and many popular applications programs.

With 20 diskettes and 2 hours to load and configure just one system, imagine the time you'll save and the potential hassles you'll avoid. Which gives you yet another reason to buy a Dell i486 system:

When you open the box, you're ready to go.

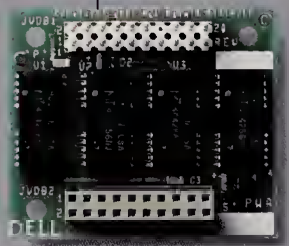


Random Dell computers are "burnt in" at 104 degrees Fahrenheit.

And if you think that's rough, consider our shock test. Sample i486 computers are strapped to a guillotine-like apparatus which repeatedly drops them to the ground. This tells us what we can do to improve their shock tolerance level.

Our power supply units undergo an equally rigorous quality control process. In a test that simulates several years of actual usage, randomly selected test units are switched on and off *1,200 times;* only then can they be approved.

While our testing may seem a little extreme, it's based on a rather simple fact: if our machines don't fail with us, they haven't much chance of failing with you, either.



A small expansion of video memory gives you over 32,000 colors for a near photographic quality display.

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WE THINK A COMPUTER SHOULD COME WITH MORE SUPPORT THAN THIS.

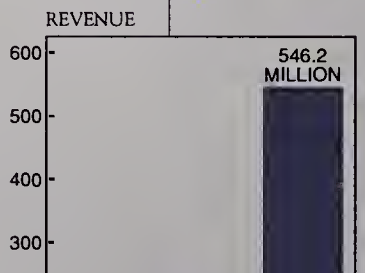
As a potential buyer, you'll receive lots of attention from most computer companies. Until they receive your check, that is. For all practical purposes, once the sale is closed, so is the company.

At Dell, on the other hand, half our story begins after you receive your computer. Despite our low prices, we've built a reputation for the highest level of support in the industry.

To begin with, a Dell expert works with you to figure out which computer, with which options, works best for you. We help you arrange financing from a wide variety of credit, lease and lease-to-buy plans. Then we test, pack and ship your personalized personal computer to you via two-day air standard.

In the unlikely event that you have a problem with your computer, it won't last long. Our technical support staff solves 90% of reported problems over the phone. Usually in six minutes or less.

You can also get technical help 24 hours a day via our innovative TechFax℠ line. Just dial up and detailed system information will be automatically faxed back to you from the Dell Technical Library.



Dell has built a $546 million dollar business by building a relationship with every customer.

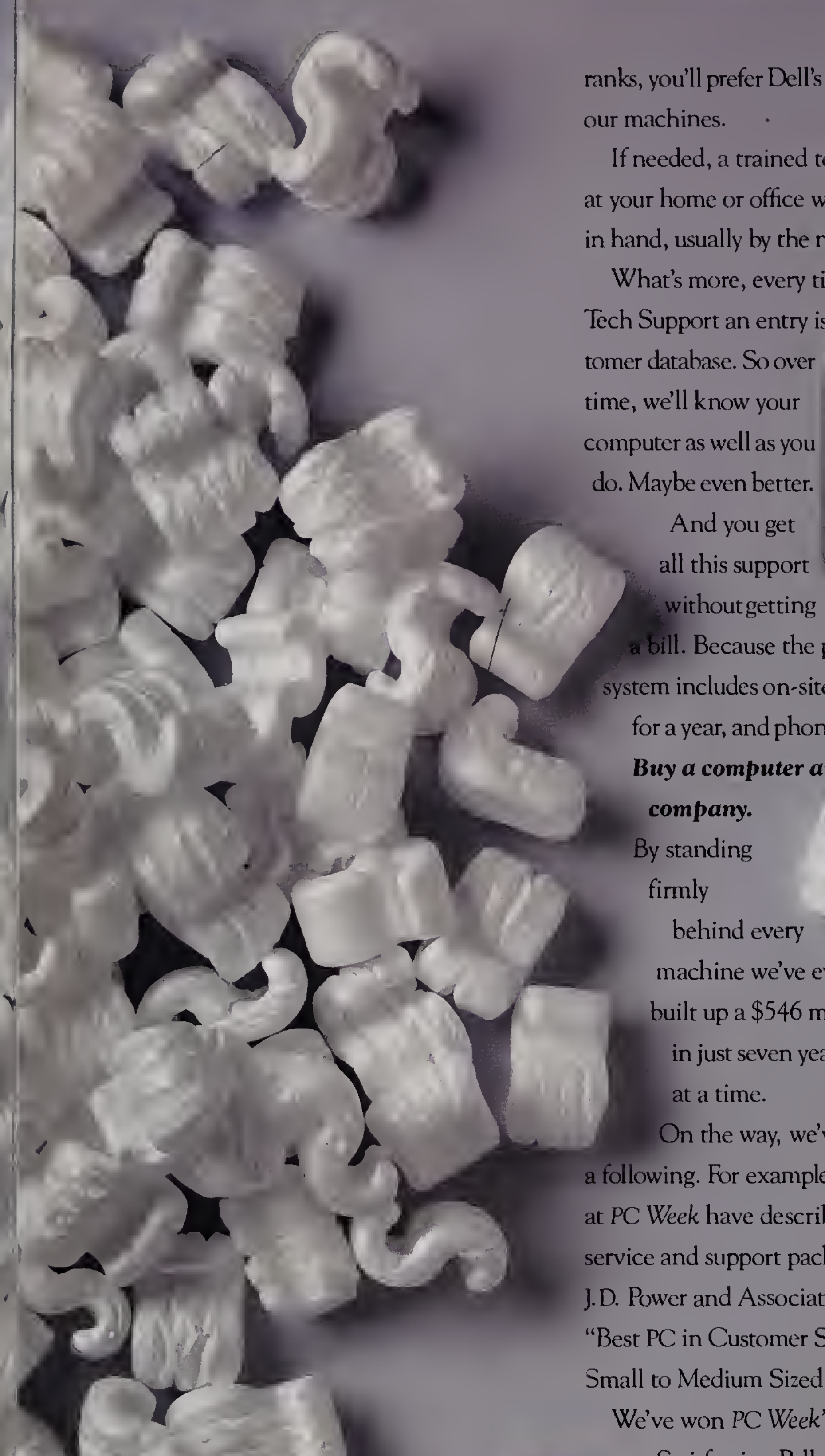
We even have a special section on CompuServe's PC vendor forum. So you can view other users' problems, and, more importantly, our solutions. But what makes our bulletin board special is that we constantly monitor what goes on there. Which means we can keep track of any small problems, and stop them before they become big ones.

But what if you have a problem that just can't be solved over the telephone?

On-site service is an ambiguous term.

To some enterprising vendors, it conveniently means that the replacement parts, and not the service technician, will arrive on-site. Which isn't as crazy as you may imagine; there are any number of do-it-yourself computer whiz kids in this business.

If you don't count yourself among their



ranks, you'll prefer Dell's way of supporting our machines.

If needed, a trained technician can be at your home or office with a solution in hand, usually by the next business day.△

What's more, every time you call Dell Tech Support an entry is made in our customer database. So over time, we'll know your computer as well as you do. Maybe even better.

Every Dell Computer comes with a trained computer staff who knows your computer as well as you do. Maybe better.

And you get all this support without getting a bill. Because the price of your system includes on-site service coverage for a year, and phone support forever.

Buy a computer and get the company. By standing firmly behind every machine we've ever sold, we've built up a $546 million company in just seven years, one customer at a time.

On the way, we've acquired quite a following. For example, the editors at *PC Week* have described the Dell service and support package as "overkill." J.D. Power and Associates® ranked Dell "Best PC in Customer Satisfaction in Small to Medium Sized Businesses."

We've won *PC Week's* Customer Satisfaction Poll an unprecedented eight times.

Last year, Dell won customer satisfaction polls in the U.S., U.K., Germany and France.

And in the last 12 months alone, we've collected 53 product awards, including *PC Magazine's* Editor's Choice, *InfoWorld's* Buyer's Insurance and *PC World's* Best Buy and World Class Awards.

And it's not just the smaller users that are satisfied, either: Dell computers are now used by over two-thirds of the FORTUNE 500.® Overseas, it's been pretty much the same story. We've more than doubled our overseas sales in the last 3 years in a row, and won in customer satisfaction surveys in the UK, Germany and France.

Still can't decide? Take 30 days to make up your mind. Within that time, if you aren't completely satisfied, just return your Dell system and we'll refund your money, no questions asked.

We're proud to add, though, that this unconditional guarantee has been used so sparingly, only 1.2% of the over half a million computers we've sold so far have ever come back.

What does keep coming back, in ever increasing numbers, are our customers. Over 70% of the people who buy a Dell computer buy another. That's perhaps the strongest statement of satisfaction any manufacturer could ever hope to receive.

So before you buy an i486 system, ask around; there are plenty of Dell users out there. And if there's anything you need, call us. But you'd better hurry.

Great computers may last a long time but great deals don't.

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☐ i486SX, 25 MHz
☐ i486, 33 MHz
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☐ VGA Color, 14", 640 x 480, .39mm dot pitch
☐ VGA Color Plus, 14", 640 x 480, .31mm dot pitch
☐ Super VGA Color, 14", 1024 x 768, 28mm dot pitch
☐ UltraScan 14C, 14", 1024 x 768, .28mm dot pitch non-interlaced, 70Hz
☐ UltraScan 15C, 15", 1024 x 768, .28mm dot pitch non-interlaced, 70Hz
☐ GPD-16C, 16", 1280 x 1024, .31mm dot pitch
☐ GPD-19C, 19", 1280 x 1024, .31mm dot pitch

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☐ MS-DOS 4.01
☐ MS-DOS 5.0
☐ MS-OS/2 1.21
☐ Dell UNIX® System V

OTHER (i.e.: tape drive, network card, mouse or modem)
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#11HA2

SYSTEMS & SOFTWARE

HARDWARE SHORTS

Fujitsu hits UK market

Fujitsu Systems of America, Inc. recently announced that ICL UK's Financial Services Division will market Fujitsu's Series 7000 Automated Teller Machines in the UK. The Series 7000 offers color graphics on a 13-in. CRT, voice guidance and enhanced access for persons with disabilities.

Unisys Corp. has announced a new Branch Automation System. Financial Systems Architecture Finesse Release 4.0 was demonstrated recently at the Bank Administration Institute Retail Delivery Show in Orlando, Fla. New features to be added into the software include enhanced customer service capabilities and support of CTOS Supergen 2000 workstation hardware. Priced at $6,000 per branch, Release 4.0 is now available.

Tandem outlines its strategy

Firm moves into client/server field in hopes of increasing market share

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Tandem Computers, Inc.'s quest to broaden its market beyond the traditional boundaries of on-line transaction processing took a new turn last month with the announcement of a client/server strategy in which Tandem machines are the "back-end" database server.

The firm has forged a series of partnerships in hope of providing client/server connectivity to many personal computers and workstations. Among the partners are Oracle Corp., Borland International, Inc., JYACC, Inc., Neuron Data, Inc. and SQ Software, Inc. Building on gateway technology licensed from Sybase, Inc., Tandem developed an SQL Server Gateway to link PC "clients" with the Tandem database server.

Tandem also said Annatek Systems, Inc., a provider of software for distributed PCs, would adapt its Network Navigator products to Tandem systems.

This client/server concept dovetails with earlier company statements about a software tools strategy to tie Tandem's proprietary Guardian operating system to open systems, such as Unix.

However, customers have yet to share Tandem's vision, according to recent interviews, because those users are accustomed to having their Tandem machines act as transaction workhorses.

Even without a client/server strategy, data stored in Tandem's Nonstop SQL relational database is relatively easy to access, users said. "We can code an SQL query and throw up screens very easily from a terminal," said Dana Barber, who manages software development at Federal Express Corp.'s Colorado Springs data center. Transient data on misplaced packages in Fedex's worldwide airport stations is stored for a few days, then purged from the Nonstop SQL database. If data is to be stored permanently, it is moved to an IBM mainframe at Fedex headquarters in Memphis.

However, Tandem would like its installed base of thousands of Tandem sites to start thinking of their Nonstop SQL systems as warehouses holding vital business data. That way, "client" PCs or workstations could launch queries against the SQL-based database, searching for patterns in the day-to-day data.

Continued on page 30

Getting together

Tandem has established a string of partnerships of late, hoping to build a client/server architecture based on its partners' tools.

Gateways:
- Oracle's SQL*Connect and SQL*Net provide connectivity with Oracle 6.0.
- Tandem's SQL Server Gateway was designed around Sybase, Inc.'s SQL Server and connects PC clients with SQL back ends.

Clients:
- Borland's Paradox 3.5 and Paradox SQL Link 1.1 provide database connections between the desktop and hosts.
- Cornerstone Software, Inc.'s Remote Server Call software provides a programming interface with both MS-DOS- and OS/2-based personal computers.

Tools:
- Caseworks, Inc. is supplying graphical user interface support for application developers.
- JYACC's JAM is an applications development tool for relational DBMSs.
- Neuron Data's Nexpert Object acts as an expert systems development tool.
- SQ Software's SQR acts as a structured query report writer.

CAD/CAM field shows demand for openness

BY MARYFRAN JOHNSON
CW STAFF

CAMBRIDGE, Mass. — IBM, Intergraph Corp. and the Computervision subsidiary of Prime Computer, Inc. all felt the undertow of the economic tide this past year in computer-aided design and manufacturing (CAD/CAM) and computer-aided engineering (CAE) sales — a $7.3 billion market they control with nearly 60% of the business.

A study from Daratech, Inc., based here, shows that product transitions, dwindling hardware prices and the recession conspired to slow industrywide growth in CAD/CAM to 5% during the past year.

Yet while the market leaders were hobbled with paltry growth rates as low as 2%, the "growth leaders" — such as Hewlett-Packard Co., Autodesk, Inc. and McDonnell Douglas Corp. — all flourished with sales increases of 20% or more, in part because of their break from proprietary platforms.

"This industry is going through a very major restructuring," said Charles Foundyller, president of market research firm Daratech. "There is a group of [end-user] companies out there that really want software only if it is available on multiple platforms. No one wants to pay a premium for the platform anymore."

HP, for example, is porting its key mechanical design software products to Unix-based Sun Microsystems, Inc. Sparcstations, slated to ship early this year. That broadening of platform choices should spur further growth for HP, whose revenue surged 20% in 1991 to make it one of the fastest growing companies among the mechanical design vendors, according to Daratech.

Autodesk's Autocad software, the most widely used CAD system in the world, showed "resounding success" with its Unix versions of the product, Daratech noted. In terms of revenue growth, Autodesk has lead the industry with 23% growth in 1991.

McDonnell Douglas in St. Louis managed to glide over the industry slow spots with revenue from its Unigraphics business growing 20% in 1991. Customers seemed even more confident of the product, the Daratech survey found, since McDonnell Douglas agreed last August to sell its CAD/CAM business to Electronic Data Systems Corp.

IBM, on the other hand, saw its revenue growth slowed to 6% on forecast sales of $2.19 billion. The computer giant is completing its product transition from mainframe-based CAD/CAM/CAE systems to workstation-based software on the RISC System/6000 line of Unix workstations and servers.

Mainframes and their system management capabilities will continue to play a critical role, however, as engineering data repositories, the report noted.

With the November 1991 CAD/CAM partnership between IBM's Cadam, Inc. and Paris-based Dassault Systemes, IBM is now marketing Cadam products for low-end desktop systems and Dassault's Catia software for mainframes and workstations. The newly coordinated efforts should dispel some of the uncertainty users have felt about the future of both product lines, Foundyller said.

Most endangered in the CAD/CAM market appears to be Intergraph in Huntsville, Ala. Daratech's survey found Intergraph users less than satisfied with the proprietary Clipper line of workstations — judging them too slow, too expensive and too far behind major competitors, Foundyller said.

Although Intergraph is now porting its Microstation and I/EMS products to Sun workstations, the majority of its mechanical business will remain on Clipper in 1992.

"If its Clipper upgrade is late, or if disgruntled users start a stampede to Sun-based systems, the company could be in for some tough times in the coming years," Foundyller cautioned.

Broader use of distribution channels through independent resellers and systems integrators is emerging as a clear trend for the '90s, according to Daratech. Computervision already offers all of its CAD/CAM/CAE, data management and geographic information system software through those channels.

Leaders hurting

In a depressed manufacturing economy, the CAD/CAM/CAE market is expected to reach only 5% growth in 1991 on forecasted revenue of $7.3 billion

1991 CAD/CAM/CAE revenue (in millions)	
IBM	$2,182
Intergraph	$1,153
Computervision	$971
HP	$445
Mentor Graphics	$392
McDonnell Douglas	$350
Autodesk	$285
Cadence	$234
Schlumberger CAD/CAM	$146
Valid	$124

Source: Daratech, Inc. CW Chart: Michael Siggins

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THE NEW IBM LASERPRINTERS. PAGES AHEAD.

Santa Fe keeps high-tech eye on trains

ON SITE

BY ELLIS BOOKER
CW STAFF

SCHAUMBURG, Ill. — On a slick track in a small New Mexico town, a Santa Fe Railroad freight train derails.

The following morning, the 60-ft-wide computerized map that shows the type, status and location of the 250 trains that start across Santa Fe's 10,650 miles of track every day is still flecked with yellow and red flags, indicating rerouted trains that are behind schedule.

Lewis: *Response time requirements 'tremendous'*

More remarkably, before this highly computerized system operations center started on Oct. 1, Santa Fe controllers here used a giant magnet board to monitor the whereabouts of trains by drawing data from a mainframe and personal computers.

"The board had no historical reporting or management reports," explained T. J. Lewis, information systems manager at the railroad's data center in Topeka, Kan. "With automation, we saw the potential to better utilize our fleet."

Driving the display, which wraps around one end of the room, are six IBM Personal System/2 Model 70s running OS/2 and Easel Corp.'s Easel interface software. With each refresh of the screen, several SQL calls are made on the IBM OS/2 Database Manager database, loading 2,000 to 7,000 rows of data from seven key tables.

The Model 90s, which are connected over a 16M bit/sec. Token Ring local-area network, are able to open up to 100 windows. The windows can show a portion of the big board's map, the arrival and departure times of trains or details of individual trains and engines, including their maintenance histories.

In addition, one of the Model 70s periodically accesses the IBM 3090 600J in Topeka to obtain information from an IMS-based maintenance database of 1,700 trains.

One planner said operators now spend 70% of their time on planning, the proportion they used to spend on clerical tasks under the manual system.

Santa Fe planners previously accessed computerized information via 3270-type terminals hooked to the 3090, where train schedules and train maintenance databases reside. "But the planners' principal function, that of tracking trains, wasn't computerized," Lewis said.

The process was labor-intensive, but it worked. In fact, keeping up the speed of the manual process of "sticking little tags on magnets" was a challenge.

"You need to understand," Lewis said, "the response-time requirements were tremendous. These people were used to moving magnets around while they talked on the phone. That was the response time we had to compete with."

Santa Fe Railroad *operations staff monitors train locations*

Planning for the new operations center began in September 1990; the first iteration of the $433,000 system was running by Sept. 16, 1991.

The future of the systems operation center may include expert systems technology, which would help planners in their task of ordering appropriately sized engines for different trains.

However, this component is at least a year away, Lewis said, noting that the replacement of the magnetic board with workstations was just the first of many projects for his 350-person IS shop.

"We already have 20 outstanding projects for 1992," he said.

Tool to provide access between AS/400, PS/2

BY SALLY CUSACK
CW STAFF

NEEDHAM, Mass. — Customers of Marcam Corp., which offers software products to the process manufacturing market using IBM Application System/400 technology, can look forward to a new cooperative processing software tool early next spring.

Slated to be announced in April 1992, Prism/CP is a graphical user interface and extension to Marcam's Prism business planning and control system.

Using Prism/CP, users will be able to share information and data between the AS/400 and an IBM Personal System/2.

Ernie Hillenmeyer, computer-integrated manufacturing manager at Iams Co., a privately held, premium pet food manufacturer based in Dayton, Ohio, said the company plans to install Prism/CP when it becomes available.

Having seen product demonstrations and attended seminars, Hillenmeyer said he is confident that the software's common user interface will enable department supervisors to take advantage of Prism data residing on the midrange without having to learn the more complex commands.

Iams is implementing Prism on an IBM AS/400 Model B70 for activity-based costing and planning. The Prism software installation began in March. Hillenmeyer predicted that all the modules will be up and running by 1993.

The company already uses OS/2-based personal computers, with Easel Corp. Easel-based applications for bar coding in its finished-goods area. Hillenmeyer said users are pleased with the interface.

Manufacturing benefit

Another benefit of Prism/CP, according to Hillenmeyer, is that it was designed on IBM's OS/2 as well as Presentation Manager and Easel software platforms — all of which Iams said are beneficial to manufacturing applications.

"Prism/CP really pays attention to IBM's [Systems Application Architecture] strategy by allowing users to talk to the AS/400 while running applications in real time," he said.

"You don't have to stop one session to start another."

Prism/CP uses IBM's standards for Common User Access, which defines guidelines for user windows to Prism. The interface includes color windows, action bars, pull-down menus, pop-up Help and icons.

Pricing for Prism/CP will start in the $10,000 to $20,000 range and will vary depending on hardware configuration.

Group hopes Unix will lure members

BY JOHANNA AMBROSIO
CW STAFF

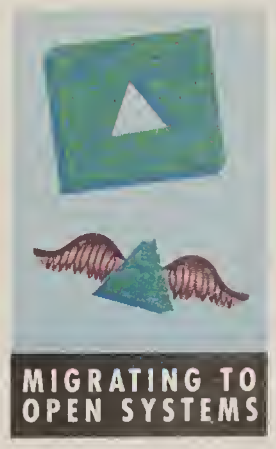
A securities industry association is hoping to attract new business by completely revamping its computer-based testing system.

The National Association of Securities Dealers (NASD), based in Rockville, Md., calls itself the nation's largest self-regulatory securities organization, with 5,400 firms and 415,000 professionals registered in it. NASD operates four markets, including the NASDAQ, and tests and certifies brokers.

The securities industry was among the first to feel the the recession, and NASD's testing business has been no exception. In 1990, the 54 testing centers administered 837,000 hours of tests to 270,000 students; the estimated figures for 1991 are 815,000 and 266,000, respectively.

NASD hopes to turn that around and plans to attract other industries to its testing centers by installing a new Unix-based computer system. "We plan to increase the number of test hours by three to four times by 1996," said Jack Samarias, vice president of information systems at NASD. About 85% of the business is accounted for by securities dealers, a percentage that he said he sees decreasing over time. "We can use [the new system] to attract other testing organizations for our system and/or for our centers," Samarias said.

The new system, called Proctor, based on Informix Software, Inc. database management software, will run on Sun Microsystems, Inc. workstations and will allow students to take their exams on personal computers linked to the Suns.



NASD is writing the Proctor applications software in-house but is subcontracting out some of the work. ERI, a systems integrator in Hauppauge, N.Y., will put the pieces together, test the system and deliver it to all the testing centers so everyone is in full production by Sept. 1.

"We wanted to write the software to control our own destiny," Samarias explained. The existing turnkey testing system — Plato — cannot be altered. NASD plans to tout its new software as a selling point to potential customers, he said. Customers will now be able to use their own software on the testing center computers.

Plato was developed originally as a training system by Control Data Corp. (CDC) and subsequently sold by CDC to The Roche Organization. NASD has had Plato installed for approximately six years.

Not only is the older system inflexible, but it is old. "It's based on CDC 730s, which they don't even make anymore," Samarias said. "Plato has been very good to us, but it was time for a technology change." He said NASD is revisiting all its technology decisions, including its Unisys Corp. and Tandem Computers, Inc. mainframes.

The new testing system is stand-alone, with no links to the mainframe. Proctor is based on Plato's general outline of test development and presentation but adds new functionality — particularly in the areas of center and network management. It incorporates around 60 Sun Sparcstations, some X terminals for staff use in scheduling exams and electronic mail and Intel Corp. 80286-based computers on which to administer the tests. Plans are to upgrade the PCs soon, Samarias said.

Ultimately, the new hardware will enable the next step: so-called adaptive testing. With this technique, the test modifies itself depending on the ability of the person taking the test. The computer presents introductory questions to determine the person's level, then presents a series of questions. The computer keeps adapting the questions to the person.

"To do that, you need the whole database to reside on the workstation because of response time issues," Samarias said.

Tandem offers new strategy

CONTINUED FROM PAGE 25

"Tandem is working very hard to get a bigger and bigger chunk of the back-end database business," said Roy Schulte, a senior software analyst at Gartner Group, Inc., based in Stamford, Conn. Tandem may even try to position itself against Teradata Corp. — recently acquired by AT&T's NCR Corp. — since Teradata database machines also use SQL access methods, according to Schulte. Both Tandem and Teradata machines are based on a parallel-processing architecture.

In an attempt to overcome its proprietary system label, Tandem helped to found the 2-year-old SQL Access Group, which promotes a single industry standard for the SQL language that would unite all relational databases. To enter the open systems market, Tandem also developed a fault-tolerant version of Unix for its 1-year-old Integrity series of Unix computers.

Just how "open" or "closed" Tandem systems are depends, in part, on your point of view, says Richard Luebke, manager of client/server marketing at Tandem. "A person developing a pure database application might see a need for [the] SQL [language], in which case the Tandem Guardian platform is just as open as any other platform," Luebke said.

Whether longtime Tandem users will embrace the new client/server strategy remains to be seen. But some have said it could well fit into their long-term plans.

"The client/server environment they're talking about is of interest to us," said Phillip Seeley, vice president of MIS at Consolidated Freightways, Inc. The company maintains a nationwide image-processing system that tracks shipment orders and then stores them on optical disc at a central site in Portland, Ore. "All of our indices [for the image system] are in SQL databases," Seeley said. "So we could do some [SQL-based] client/server applications with little difficulty. There are some applications like that in our long-term plan."

SOFTWARE SHORTS

Real-time tools added

Digital Equipment Corp. recently rolled out more than a dozen real-time products to complement existing offerings on both its Unix-based Ultrix and proprietary VAX/VMS environments. DEC incorporated the Posix 1003.4 industry standard for real-time applications into its VAXeln software environment for VAX/VMS, and it added real-time extensions to the Open Software Foundation's OSF/1 Unix operating system.

Pyramid Technology Corp. has formed a database division to promote the use of Pyramid machines as high-performance platforms for relational database applications. Pyramid's move parallels a similar one at competitor Sequent Computer Systems, Inc. in Beaverton, Ore., which formed a database division earlier this year. Pyramid will work with the major relational database management system vendors, including Oracle Corp., Sybase, Inc., Informix Software, Inc., Ask Computer Systems, Inc.'s Ingres Products Division and others to optimize database software for use on Pyramid's multiprocessor computers. Pyramid also unwrapped Pyramid Database Fastpak, a package of software products that will address the twin problems of memory contention and I/O bottlenecks that slow the performance of Unix databases. Database Fastpak, which is available immediately, ranges in price from $10,000 to $47,500.

Uniface Corp. and **Hewlett-Packard Co.** said they will integrate the Uniface applications development environment with HP's MPE/IX operating system. Users will be able to build applications that allow transparent access to data in HP's Allbase/SQL and Turboimage databases and third-party relational databases.

Oracle recently said that it will support Intel Corp.'s Intel 386 Family Binary Compatibility Specification 2 (IBCS2) standard in Version 6.0 and Version 7.0 of its Oracle relational database products. The Intel standard is supported on many Unix System V Release 3 and System V Release 4 desktop machines, including Compaq Computer Corp.'s Systempro, NCR Corp.'s 3000 series and computers from The Santa Cruz Operation. Oracle is pricing a single-user copy of its Oracle 6.0 RDBMS at $1,700. It will be released on floppy disks and tape cartridges; Oracle also plans to ship the software on compact disc/read-only memory media in 1992.

Other Financial Software Rely Heavily on this Hardware...

Downsizing brings unexpected bonus

Seed firm boosts software integration substantially after putting mainframe out to pasture

BY SALLY CUSACK
CW STAFF

MINNEAPOLIS — When one of the world's largest agricultural seed producers and distributors, Northrup King Co., downsized from an IBM mainframe to a midrange system, it found an unexpected gain.

While the company expected substantial benefits from the resulting software integration, it was surprised by the capabilities of the menu management system.

Northrup King, owned by Sandoz Ltd., develops, produces and markets hybrid seed corn, soybeans, alfalfa and sorghum as well as several other farm seed products.

The publicly held company employs more than 800 people worldwide and operates 20 research sites throughout the world.

The company decided in July 1990 to replace an IBM 4381 with an IBM Application System/400 Model D80.

The 4381 was responsible for all accounting and associated applications, but according to Brad Larson, project manager for financial systems at Northrup King, the integration capabilities just "weren't there" on the 4381.

"We have some uniqueness in the way we handle orders, such as producing compilations of farmers' seed orders for our dealers," said Larson, adding that the company has no direct sales force — it works directly through dealer organizations.

The firm determined that the new software implementation on the AS/400 must serve to produce market information and offer data to help better position the product while servicing the dealer organizations.

There are between 150 and 200 people linked into the AS/400 via terminals and personal computers on an Ethernet network. With 60% of those users at remote site locations, data integration and delivery on products and inventory were important issues.

To that end, Northrup selected Software 2000, Inc.'s General Ledger and Accounts Payable programs to handle financial applications and Marcam Corp.'s Prism package for product inventory and sales order management systems.

The integration between Software 2000 and Marcam software was completed very soon after the products were delivered, Larson said, adding that one of the major benefits in the whole transition process has been the Application Manager 2000 product that Software 2000 supplies with its products.

By providing a single menu management and security tool interface, the application manager gives all the software systems on the AS/400 the same "touch and feel" to the end-user community, he said.

"It was very easy to integrate all the software under the application manager, and security access is controlled by menu item," Larson said. "It is a very flexible system — it only takes about five minutes to add any menu item."

> ONE OF THE benefits of the transition to the AS/400 was the Application Manager 2000 product that Software 2000 supplies with its products.
>
> BRAD LARSON
> NORTHRUP KING

Northrup King had also decided to develop some nonpackaged applications in-house to address some specific dealer information needs.

In conjunction with Coopers & Lybrand, Northrup King elected to use Synon/2E, a computer-aided software engineering tool from Synon, Inc. for design and development.

Larson characterized the Synon product as "quite straightforward" in its programming approach, and he said the Synon-developed applications are also integrated into the Application Manager 2000 menu management system.

So far, the implementation has gone well. "We've basically come through with just some minor hitches and bumps," Larson said, adding that he expects everything to be completed by the end of this year or early next year.

One of the biggest advantages with the AS/400 platform is the data access and query capabilities that the environment provides, Larson said.

"We can move some of the data query tasks to the end user and away from MIS. And more and more questions that were directed to MIS can now be resolved at the user level."

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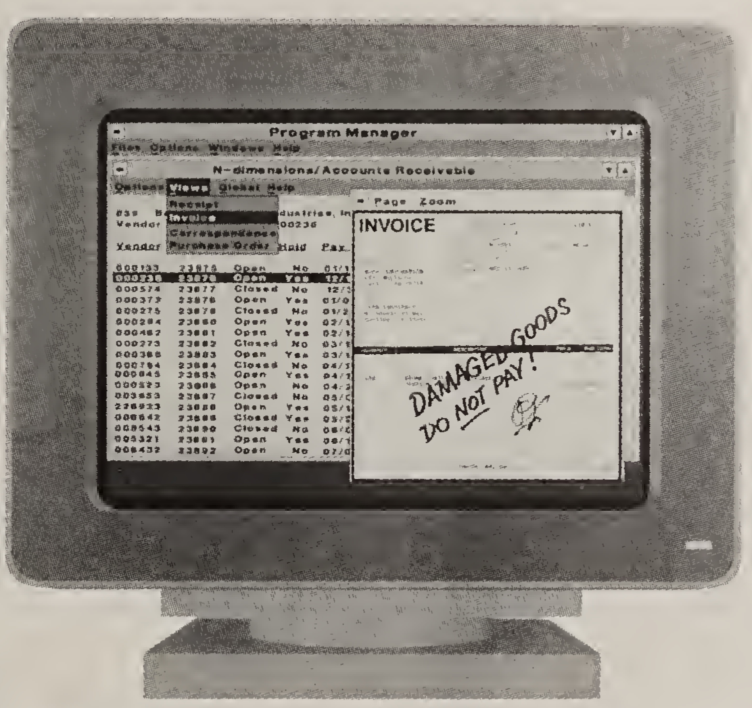

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NEW PRODUCTS — SOFTWARE

Development tools

Fortran-Lint for VMS, a Fortran static source-code analysis tool from Information Processing Techniques Corp., has been updated.

Fortran-Lint now includes support for Digital Equipment Corp.'s VAX DBMS database application code. The upgraded version makes it unnecessary to run database management system code through a preprocessor before using Fortran-Lint. The analysis process is streamlined, the company reported.

Pricing is $3,900 per user.

Information Processing Techniques
1096 E. Meadow Circle
Palo Alto, Calif. 94303
(415) 494-7500

XDB Systems, Inc. has started shipping XDB-Workbench Version 2.41.

The product allows Cobol programmers to develop and run IBM DB2 applications on personal computers. The new release offers more complete DB2 compatibility along with referential integrity clauses, date and time functions, table functions and other enhancements.

XDB-Workbench 2.41 supports both DOS and OS/2 and is priced at $1,500.

XDB Systems
14700 Sweitzer Lane
Laurel, Md. 20707
(301) 317-6800

System software

Pencom Software has upgraded its Co-Xist software package for Next, Inc. workstations.

With Co-Xist, Next users can run X Window System software. Release 2.1.1 provides full client/server support for X Window Version X11R4. Color support and cut-and-paste features have also been added.

Pricing for the software starts at $249.

Pencom Software
Suite 300
9050 Capital of Texas Highway N.
Austin, Texas 78759
(512) 343-1111

Unix

Interactive Development Environments, Inc. has ported its Software through Pictures 4.2 development tools to The Santa Cruz Operation's SCO Open Desktop.

Software through Pictures is a multiuser integrated computer-aided software development environment.

The SCO Open Desktop version costs between $5,000 and $21,000, depending on hardware platform.

Interactive Development
Environments
595 Market St.
San Francisco, Calif. 94105
(415) 543-0900

HARDWARE

Processors

Radstone Technology Corp. has announced a VME module for image and graphics processing.

The Visionmaster handles both computer-generated and live images. It offers a programmable video format and diplays images with up to 2,048- by 1,024-pixel resolution. It includes 4M bytes of memory. Supported functions include line drawing, filtering and edge detection.

Visionmaster is priced at $14,950.

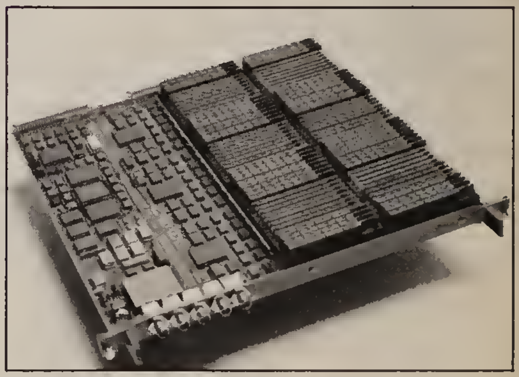
Radstone Technology
20 Craig Road
Montvale, N.J. 07645
(201) 391-2700

I/O devices

Tektronix, Inc. has introduced a color X terminal with a small footprint.

The Tekxpress XP26 features a 17-in. display with 1,152- by 900-pixel resolution, .28mm dot pitch and a 72Hz refresh rate. It is priced at $4,750.

Tektronix
26600 S.W. Pkwy.
Wilsonville, Ore. 97070
(501) 685-2838



The Viewstore board *offers detailed image examination*

A high-capacity frame buffer board has been developed by Viewgraphics, Inc.

The Viewstore board provides workstations with up to 384M bytes of 24-bit color image storage, which can hold 372 standard TV images or more than 12 seconds of video output. The board also offers a magnification feature for image examination during live-video playback.

The VME-based board is priced from $25,000 for a 96M-byte version to $49,000 for the 384M-byte model.

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Mountain View, Calif. 94043
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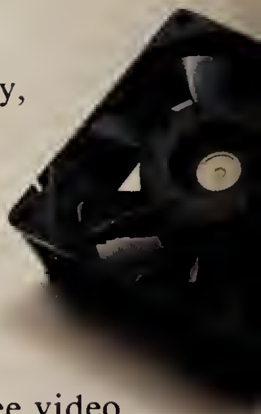

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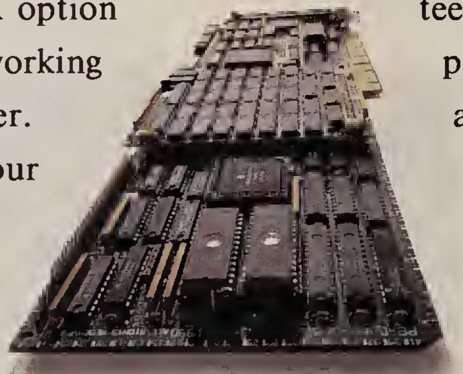

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FIFTH GENERATION SYSTEMS, INC

Hyundai hits road with laptops; shifts to second part of project

BY MICHAEL FITZGERALD
CW STAFF

FOUNTAIN VALLEY, Calif. — At Hyundai Motor America, a two-year push to use laptops is heading into Phase 2.

Hyundai finished the final pieces of Phase 1 about two months ago and has outfitted all 60 of its dealer representatives with Compaq Computer Corp. LTE 286 notebooks running a variety of software.

The initial payoff was solid: Hyundai's regions report a reduced work load on central administrative staffs and less need to fly representatives in for meetings, and some represenatives say they have seen phone bills drop by as much as $300 a month, thanks to electronic mail.

Hyundai's representatives, or field travelers, as they are called, also save time in meetings by being able to pinpoint specific numbers in spreadsheets, rather than searching through reams of paper, as they did before.

Now, field travelers can call the shots in improving the way they use laptops.

"We're trying to push empowerment, give them more information so they can make more decisions when they're in with the dealers," said Carrie M. Ulvestad, Hyundai's national manager of dealer communications.

Alan Levenson

Hyundai's Ulvestad *helped firm shift gears with laptops*

Hyundai has created a Field Traveler Council consisting of a parts and service representative and a district sales manager from each of its four regions. Also on the council are Ulvestad; Bette D. King, Hyundai's information center manager; Nancy R. Bethel, a senior office systems analyst; and two field liaisons from the national office.

First on the list is improved

Continued on page 44

Modular software poised to gain foothold this year

BY CAROL HILDEBRAND
CW STAFF

They say that breaking up is hard to do, but the lure of modularity in software is that it is just the opposite.

Modular software — or an application that comes in several segments that can be removed and either run alone, added to another application or hooked into other applications via open system interfaces — has been gaining ground recently, particularly as applications start to exploit Microsoft Corp.'s Object Linking and Embedding (OLE) and Dynamic Data Exchange (DDE) functions.

In the Windows world, such applications are just beginning to hit the shelves, and analysts predicted that it will take until late 1992 for modularity — in the form of support for DDE or OLE — to become a definitive feature for a piece of software.

Modular software

What it is: Modular software is like a set of Leggo building blocks. Different modules of the software can be broken out and used on a stand-alone basis.

Pros: It cuts down on development time and allows users to custom mix and match an application.

Cons: Distribution issues could crop up as applications intermingle.

CW Chart: Marie Haines

"Once we get a critical mass of pieces, users will get a handle on it and be able to combine to create more interesting applications," said Rich Bader, contributing editor at "PC Letter."

Jesse Berst, editor of "Windows Watcher," said developing modular software will not only decrease time to market but will enable third-party developers to more easily piggyback their applications onto larger core packages. He added that the mix-and-match option will be a boon to users. Once modularity gains ground, he said, "If you like one graphics package's slide sorter but would rather have Charisma's charting module, you can stick it in."

There is clearly user interest in the concept of modularity, but the definition of it is variable. "There's very little in the marketplace, and people are still trying to figure out what it means," Bader noted.

According to Matt Edelstein, a beta-test user for Lotus Development Corp.'s Ami Professional word processor at Information Projects Group in Herndon, Va., "I always thought that the basic kernel of a word processor should be entry-level, and you could then sell modular add-ons" as a user desires more sophisticated features.

Mary Lou McPherson, an information technology specialist at Michigan State University, said she sees it as applications working together seamlessly as vendors reach more of a collaborative stage. "As vendors move toward the center, there will be more overlapping," she said, citing, for example, Aldus Corp.'s Pagemaker, which can grab information from a database when needed.

Vendors queried at a seminar on applications in the '90s at November's PC Expo in Chicago expressed varying degrees of willingness to break an application down modularly. While Lotus said that its current method of distribution would make it difficult to break apart an application, other companies, such as Macromind, Inc. and Borland International, Inc., said that more basic applications with optional add-ons were in the works.

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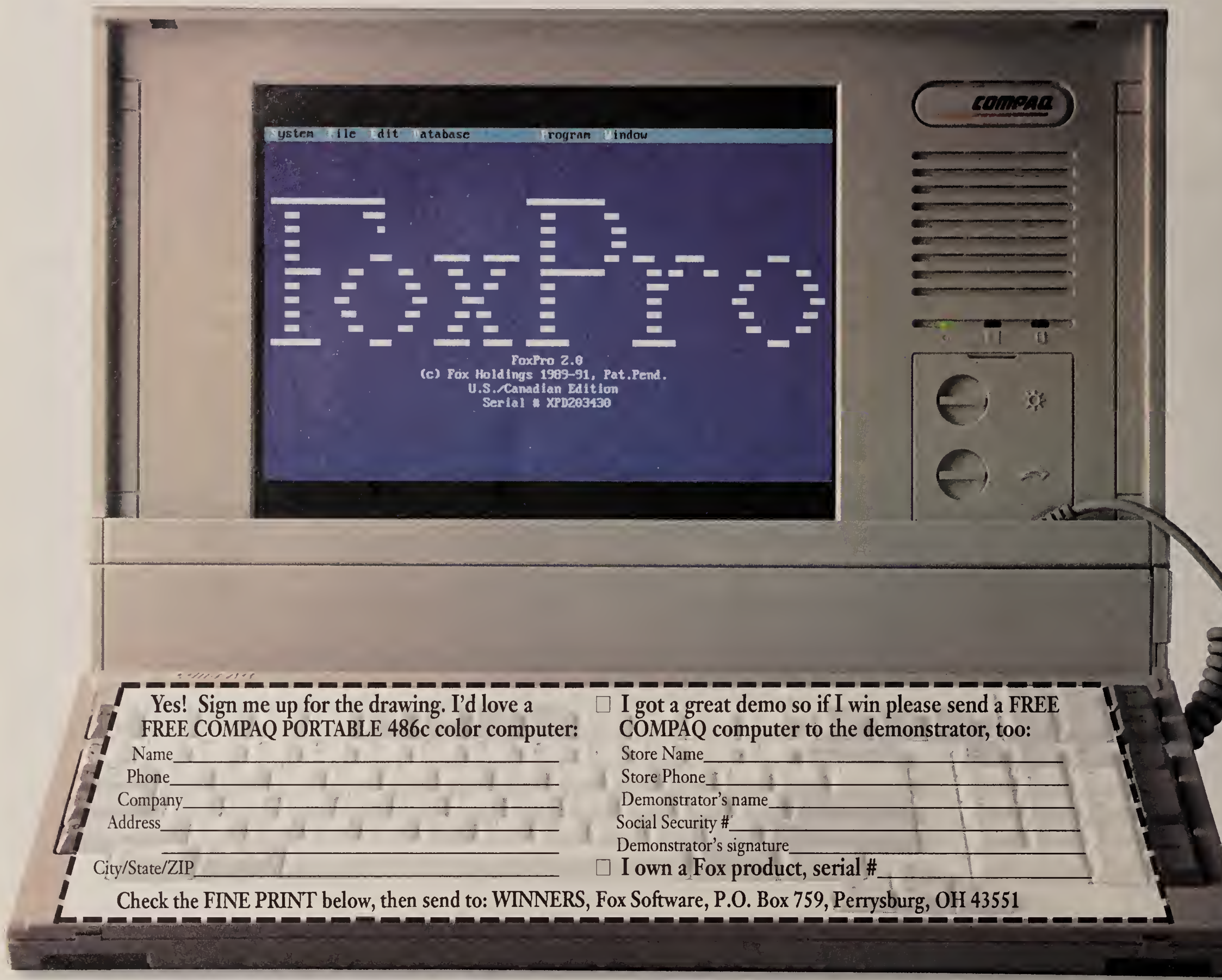
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Insurer sees future in imaging strategy

Central Life Assurance implements paperless work-flow arrangement in accounts department

ON SITE

BY JAMES DALY
CW STAFF

DES MOINES, Iowa — Hundreds of miles from the nearest ocean, underwriters at the $2.2 billion Central Life Assurance Co. (CLA) were drowning — in paper, that is.

But rather than reach for the first life preserver it was tossed, the insurer waited to find something that would help keep it afloat in the long term.

During the next few weeks, after 96 years of scribbling out new insurance applications by hand, CLA will complete work on a paperless work-flow arrangement in its new accounts department that will finally give overstuffed filing cabinets a breather. If all goes smoothly, it could rapidly expand to the far corners of the organization.

Slow procedures

Like many offices, CLA uses data entry clerks to enter information from handwritten documents into a data processing system. And like many organizations seduced by the promise of the paperless office, the problems with that old system were myriad: File cabinets take up valuable floor space, misfilings cause confusion, outdated documents may be mixed in with up-to-date ones, and paper is easily destroyed or lost.

“It was getting to the point where you couldn't tell exactly where a document was at any given moment,” said Gary Rasmussen, CLA's business analyst.

Odds were that the problem was going to get worse before it got better. Business has been good at CLA, which now operates in 44 states and handles more than $18 billion in individual life insurance. The amount of paperwork appeared to be heading in one direction: up.

Central Life document imaging systems

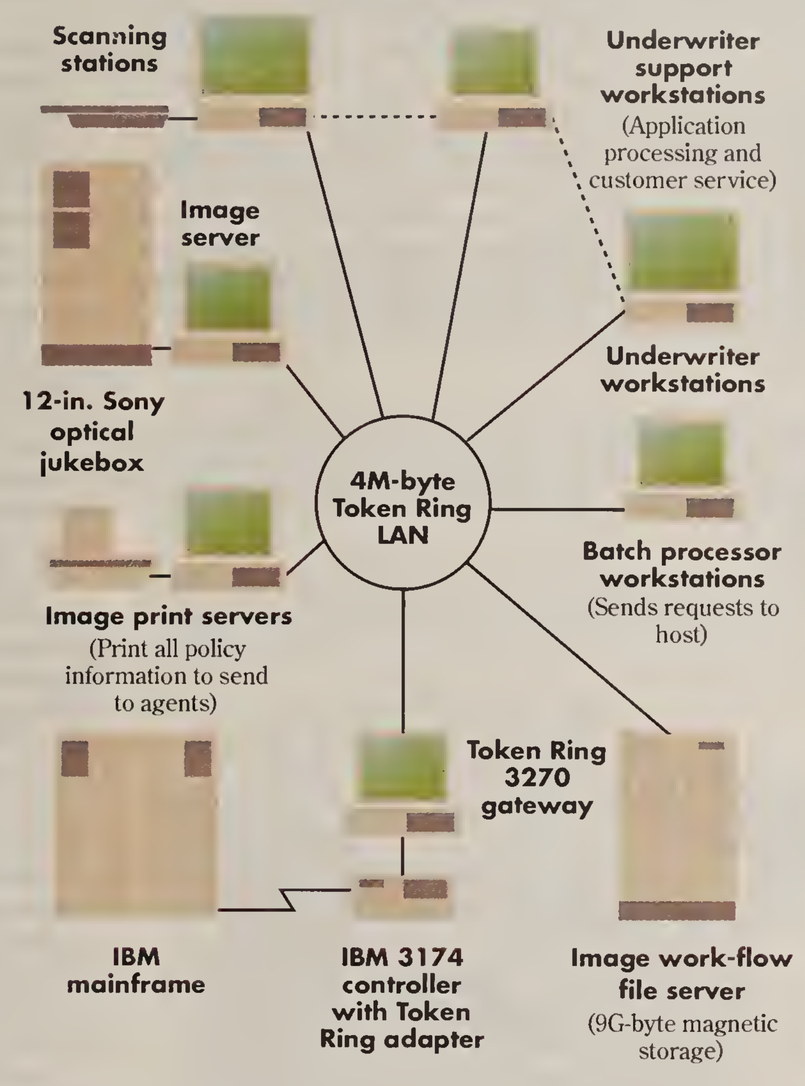
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Image work-flow file server
(9G-byte magnetic storage)

Source: Metafile Information Systems, Inc.

CLA plotted out an advanced imaging system for more than a year and finally decided to build a system that used a cooperative processing approach to integrate data processing, text management and document image processing. Receiving information, data entry, underwriting and policy preparation was all to be tightly linked.

The first proposed solution was suggested by folks from IBM. It called for running an imaging system on CLA's Application System/400 and OS/2. It was rejected as too costly.

CLA officials instead opted for a desktop system powered by Metafile Information Systems, Inc.'s Metaview software, a high-level, object-driven language for developing imaging applications in a cooperative processing environment.

The Metaview system involved less processing power and expense. “Metaview didn't require our AS/400 at all,” said George Eldridge, senior vice president of corporate services. Eldridge said the ability to circumvent the AS/400 saved “hundreds of thousands of dollars.”

First step

The data-capture process begins when insurance seekers send applications to CLA. The application is scanned at the mail room, and the images are indexed and checked for quality. The images are stored magnetically at first and then transferred to 12-in. optical disc in a Sony Corp. 50-disk jukebox.

The images are accessed via a fiber-optic backbone from a Netframe NF 400. Operators use about 60 Intel Corp. 80386-based IBM Personal System/2s. Files are kept in magnetic storage while active, or about eight weeks. They are then archived on optical disc, Rasmussen said.

Up to 700 pages a day are then routed to the appropriate work queues. Correspondence goes to a mail queue, where it is related to a file by policy number, and the network server provides any associated documents.

Underwriting files contain all information related to a specific account: financial reports, medical information, photographs and so on. When a file is complete, underwriters review all the documents and then approve or deny the application.

Although still in its infancy, the new system has already affected other areas of CLA, particularly customer service. “We have instant status reports, which saves hours of searching,” Rasmussen said. “We call up files while on the phone. Returning calls is a thing of the past.”

If the system lives up to expectations, it will be expanded to include added functions.

Met Life finds dividend in automation system

BY ROSEMARY HAMILTON
CW STAFF

All it took was Microsoft Corp.'s MS-DOS and an application development tool, and the Company Property and Services (CP&S) department at Metropolitan Life Insurance Co. was up and running.

While other segments of the insurance company are automated, this department has long gotten by with only a few personal computers and no on-line management of its activities.

The group handles 17 properties, totaling about 6.2 million sq ft, for the insurance company. That includes management of contracts, security and fire safety for these buildings, which are located throughout the country.

“It's not a division that puts money into the company,” said Peter Barrett, a project manager at Met Life who helped automate CP&S. “The ones that are more cost centers are the last in the pecking order, if you will.”

The department may not be a high priority, but it needed a system to better manage the building operations and deliver data to its executives in a timely fashion, Barrett said.

The group put together a task force last year. Some of the initial decisions were easy. For instance, the department selected MS-DOS as its platform because it wanted a network of personal computers, and MS-DOS is the standard desktop operating environment at the insurance company, Barrett said.

Third-party chasm

The task force began meeting on a weekly basis to determine what CP&S' users needed. It looked at third-party packages for facilities management, but it could not find an off-the-shelf offering that suited users' needs.

The next step, then, was to find software that would allow them to create their own systems. The group selected Clipper, a software development system designed by Nantucket Corp. in Los Angeles.

The Clipper software was recommended by an outside consultant and has been used in other departments at Met Life. Barrett said it allows for quick and easy development of applications and added that its advantage is that it lets the group tailor an application to “exactly the way you want it.”

Barrett said the application work was being done by one programmer while another worked on interfaces to hook the software to the mainframe databases.

The system is called the Facilities Administration System and includes such modules as contract and budget management.

PC & WORKSTATION SHORTS

Vendors collaborate on security

Datamedia Corp. and **Micronyx, Inc.** have signed an agreement to work together on developing a new generation of security and control products for personal computing environments. The companies have targeted early 1992 for shipment of the first hardware and software components.

Fremont, Calif.-based **Everex Systems, Inc.** recently began shipping its 5.2-pound Tempo Carrier notebook computer, which it claims is the lightest notebook to have both an internal floppy and a hard drive as well as the first to use an integrated pointing device called the Keymouse. Tempo Carrier is based on Intel Corp.'s 20-MHz 80386SX chip and features an internal floppy drive, 2M bytes of random-access memory and a 40M- or 80M-byte hard disk. Pricing starts at $2,795.

Computer Associates International, Inc. has released a new version, 3.1, of its ACCPAC BPI account series for the personal computer. Enhancements include the ability to define benefits, deductions and payroll taxes in a variety of situations and support for benefit plans that allow employees to set aside pretax funds for medical and dependent care. ACCPAC BPI 3.1 is available now for $395.

AT&T's **NCR Corp.** division announced recently that it would cut prices on the Safari NSX/20 laptop with a 40M-byte hard drive from $4,749 to $4,199. It will also expand distribution to include NCR's reseller base, as well as AT&T's existing base of resellers.

Twinhead Corp., a Milpitas, Calif.-based subsidiary of a Taiwanese clone maker, recently said that it will provide on-site warranty service for its Twinhead portables through **TRW, Inc.**'s Customer Service Division depot service centers.

COMMENTARY

Jesse Berst

Worth the pain

There is a myth going around that Windows is virtually impossible to network, so let me set the record straight: Networking Windows is a pain, but it is often worth the pain.

Perhaps Windows got its bad reputation because it's so much trouble to install on a network. The out-of-the-box settings are not right for networking. You must tune Windows manually before it will run properly.

You must also anticipate all the different hardware configurations used as workstations and prepare a different SYSTEM.INI file for each one. (SYSTEM.INI is an initialization file that adapts Windows for a particular hardware environment.) Even after painstaking installation and careful tuning, some users continue to complain of frequent crashes. Often, these crashes result from memory-resident DOS programs that conflict with Windows.

And almost everybody gripes about printing. Remote printing is difficult or impossible, they say. And even working with printers on the file server forces you to go through enough tweaking "to drive anybody crazy," according to one user.

Despite these problems, those who have made it through the arduous setup and shakedown procedures say it's worth the pain. If you've decided to standardize on Windows, you can save a lot of money by running it from the network.

"My studies show it is three to 10 times more expensive to run Windows locally as opposed to running it from the server," says Brian Livingston, president of Windows Computing in Seattle. Livingston has managed networks and Windows projects for several companies. Today, he is a consultant and columnist as well as the author of *Windows 3 Secrets*.

Windows saves money by reducing installation and upgrade time. The trick is to install and run Windows and Windows applications from the server. That way, updating to the latest version requires only installing it once on the server, not dozens of times on local workstations.

If you stop to realize how often a Windows user must install new software, or a new version of existing software, or a bug fix, or a new screen driver, or new printer settings, you will soon understand why the savings can quickly add up to many thousands of dollars.

The "Windows from the server" approach also makes it easier to monitor compliance with software license agreements. And it might let you save with concurrent licensing schemes.

Most companies find that even if 100 users need a program sometime during the week, fewer than 30 ever need it simultaneously. If you install your applications on local workstations, you must pay for 100 programs. If you run from a centralized server, you can, in theory, buy just the 30 you really need. (In practice, license arrangements vary by vendor.)

Of course, you don't get these benefits without a price. For one thing, you need a fast hard drive and a large disk cache on the server. Otherwise, Windows will bog down the network. Still, it's cheaper to buy extra disk space and more RAM for a single server than for every workstation.

Moreover, you must plan enough time and resources to fine-tune the system. Otherwise, Windows may bring your network to its knees. The adjustments should be done by an experienced Windows networker who knows the tricks that have been discovered over the past year and a half.

For instance, plain-vanilla Windows can take up to several minutes to load over the network. But with the addition of a few lines to SYSTEM.INI, it can load as fast as it does from a local hard drive.

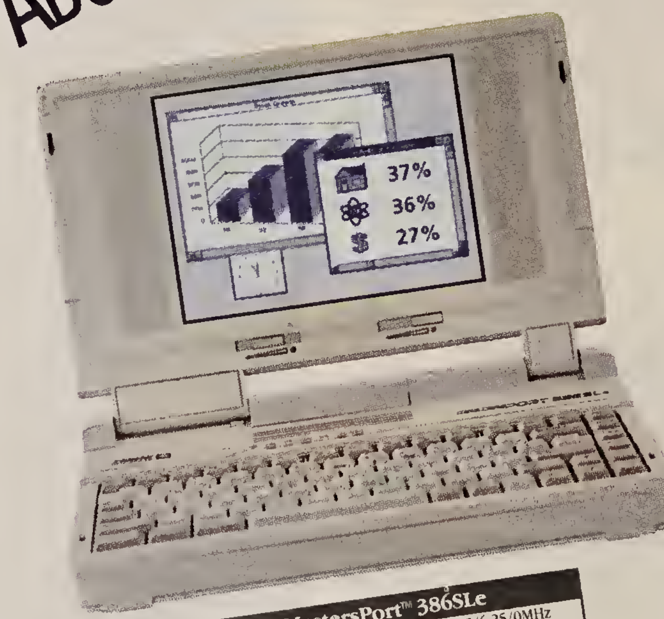
We're only a few months away from the release of Windows 3.1. In the sneak previews I've seen, Version 3.1 brings some welcome improvements in logging and browsing over a network.

And the best is still to come. Later in 1992, Microsoft will come out with a simple peer-to-peer networking scheme — at least, according to the rumors. If you can wait a little longer, you'll eventually have full-scale networking built right into Windows.

Microsoft is putting networking into New Technology (NT), the rewritten-from-the-ground-up operating system it hopes to introduce sometime in 1992. Although NT is for high-end workstations and servers, many of those advanced networking services will also migrate to the DOS/Windows operating environment, probably by 1993.

That's tomorrow. Today, running Windows from a network is more trouble than it should be. (Are you listening, Microsoft?) But if you take the time to dig around, the expertise, information and utilities are out there to make Windows run as well from a LAN as it does on a single desktop.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.



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Microsoft's Visual Basic simple alternative to C

Technology Analysis — A roundup of expert opinions about new products. Summaries written by New Products Writer Derek Slater.

Microsoft Corp. teaches the old dog a whole new repertoire with Visual Basic, which offers a graphical programming environment for developing Windows 3.0 applications in the Basic language.

Ease of use: Reviewers said Visual Basic greatly simplifies development. According to *Byte* magazine, while Visual Basic is not difficult to use, it does require the programmer to learn a new set of concepts and methods. On-line Help is extensive.

Environment: The programming environment is genuinely graphical. Visual Basic develops event-driven programs.

Tools/extensions: A tool palette offers quick access to programming functions. Windows functions, including Dynamic Data Exchange, Clipboard and Printer, are directly supported, although Windows' Multiple Document Interface is not.

Debugging: Debugging is fully integrated but can be complicated in larger projects, reviewers said. An incremental compiler helps pinpoint errors at the time they are written.

Value: At $199, Visual Basic is an excellent value and a strong alternative to the C language.

Microsoft's Visual Basic 1.0

Reviews	Ease of use	Environment	Tools/ Extensions	Debugging	Value	Overall
Infoworld 8/19/91	Very good	Excellent	Excellent	Very good	Excellent	8.6*
Byte 10/91	Not difficult, but complex	Novel approach requires learning	Visually select interface objects	Easy	Excellent alternative to C	Easy applications development
PC Week 9/16/91	Quick and easy	Graphical	Lacks Windows MDI support	Integrated	Compiles royalty-free executables	Terrific tool
PC Computing 7/91	Select actions from drop-down lists	Object-oriented environment	Extensible	NC	Obvious choice	Most important Windows product
Users						
Ron Peterson, Continental Mills, Inc.	■■■	■■■■	■■■	■■■	■■■■	Makes life a lot easier
Selden McCabe, SPN Systems	■■■■	■■■■	■■■	■■■	■■■■	6 months' work in 12 hours
Tom Daley, Midwest Stock Exchange, Inc.	■■■■	■■■■	■■■	■■■■	■■■■	Very easy; SDK was torture
Analysts						
Chris LeTocq, Computer Intelligence/Infocorp	■■■■	■■■■	■■■■	■■■	■■■■	Event-driven environment
Karen Offerman, Datapro Information Services Group	■■■■	■■■■	■■	■■■	■■■■	Going to evolve

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1 to 10 scale.

Vendor financial ratings

Analysts	Short-term performance	Long-term stability
Peter Rogers, Robertson, Stephens & Co.	■■■■	■■■■
W. Christopher Mortenson, Alex. Brown & Sons, Inc.	■■■■	■■■■

Microsoft Corp., based in Redmond, Wash., reported 1991 revenue of $580.5 million, a 57% increase over 1990, and profit of $144 million, a 64% increase over 1990.

Microsoft responds

Nevet Basker, product manager:

Tools/extensions: Users can operate the custom controls feature to create a tool that plugs seamlessly into Visual Basic. We have a huge number of third-party vendors offering libraries and tools. It is a straightforward process for us to use the same procedure to add new features to Visual Basic without dramatically restructuring the product.

Realizer: Strong, competitive tool from Within

Within Technologies, Inc.'s Realizer is a standard version of Basic programming that runs under Windows 3.0. It includes a graphical development tool and an excellent set of libraries. Reviewers described Realizer as a powerful, professional tool.

Ease of use: Basic programming techniques transfer easily to Realizer, reviewers said.

Environment: Realizer provides a traditional implementation of Basic. Although a graphical development tool — called Formdev — is included, the programming environment is not primarily graphical. *Byte* magazine said Realizer is not yet smoothly integrated within itself.

Tools/extensions: Realizer includes strong Programmable Application Tools (or interface objects) for chart, spreadsheet and schedule functions; code libraries are included for other functions, such as communications and statistics. Reviewers said Realizer's tool set is powerful and complete.

Debugging: Debugging features are adequate and offer speedy performance.

Value: Professional programmers will find Realizer a good value at $395, reviewers said. It can replace C language for Windows programming, or it might be used for quick applications prototyping.

Within Technologies' Realizer 1.0

Reviews	Ease of use	Environment	Tools/ Extensions	Debugging	Value	Overall
Infoworld 10/21/91	Good	More traditional	Very good	Very good	Good	6.6
Byte 10/91	Requires more knowledge	Not a true visual tool	Extensive array	Powerful	Excellent alternative to C	Plenty of functions and power
PC Week 9/16/91	Easy to design graphically	Does not have polished feel	Noteworthy and useful	Effective and easy	NC	Terrific tool
PC Magazine 10/15/91	Straightforward	More traditional	Exceptionally powerful libraries	Straightforward	NC	Programming breakthrough
Users						
Michael Colligan, Tandem Computers, Inc.	■■■■	■■■	■■■■	■■■■	■■■■	Easy to use, very productive
Paul Rickert, Parity Software Systems	■■■■	■■■	■■■	■■■■	■■■■	Superlative tool
Larry Ledden, Hughes Aircraft Co.	■■■■	■■■	■■	■■■	■■■■	Extremely high level of functionality
Analysts						
Richard Duff, Insight, Inc.	■■■■	■■■■	■■■■	■■■■	■■■■	Very valuable for prototyping
Ernest Ellingson, Ellingson & Associates, Inc.	■■■■	■■■■	■■■■	■■■■	■■■■	Virtually every tool you need

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1 to 10 scale.

Vendor financial information

Within Technologies, Inc. is a privately held company incorporated in 1990. It is based in Mount Laurel, N.J., has approximately 25 employees and is profitable, according to the company. Realizer is Within Technologies' first product.

Within responds

Michael Hyman, vice president of product marketing:

Environment: We do have graphical tools. The difference is we don't force you to program that way. You can still use standard techniques.

Tools/extensions: We will enhance the spreadsheet and chart tools. We also plan to add features that facilitate downsizing database applications.

Hyundai rides with laptops

CONTINUED FROM PAGE 37

communications facilities, Ulvestad said.

"Basically, they said that if we don't fix the communication problems we have now, they don't want to get any more information than they already have."

Hyundai is looking at a variety of methods to improve communication facilities, including finding 9.6K bit/sec. data modems that will fit into the LTE form factor and putting in a dedicated line at a dealership just for the field traveler, to reduce disruptions of dealer business. Typically, most dealers have dedicated lines for specific needs, such as a fax machine and new communications software.

Technology in the field

In 1988, Hyundai decided to analyze whether it could gainfully employ technology of any sort for its field travelers and found that it could. So in 1989, Hyundai rolled out notebooks in its central region.

"We didn't go in to try and fit laptops into their jobs," Ulvestad said. She added that most representatives carried reams of paper with information, on the off chance they would have to look up something.

> "WE DIDN'T GO in to try and fit laptops into their jobs."
>
> CARRIE ULVESTAD
> HYUNDAI

"We found a high percentage of their time was spent doing telephone calls [back to the regional offices], and the second time-waster we saw was administrative paperwork," Ulvestad said.

Field travelers must send back reports on each dealer visit, via a typical "route to next person" fashion.

The challenge Ulvestad and her team faced was increasing the time they could spend meeting with dealers and their effectiveness during that time.

At the end of the test, the central region's general manager told Hyundai Motor America's executive committee, "If you try to take these PCs away from my people, I'd have complete mutiny. You cannot take these away; we are dependent on them, that's how they do their jobs." Hyundai rolled out portables to the rest of its regions, a process it completed in November 1991.

Only the initial phase used SLT models purchased from a Compaq dealer. Some four months into the pilot, the lighter, smaller LTE 286 appeared. Ulvestad said "we were quite upset" by this, as the company had researched the market before buying. So it moved to leasing to avoid getting caught again.

Installed on the notebooks are Lotus Development Corp.'s Lotus 2.01 spreadsheet, IBM's Displaywrite IV word processor, PS/PC's communications package and compiled versions of Microrim, Inc.'s Rbase 3.0 applications. Hyundai will upgrade to Lotus 3.1 soon and may add a graphics presentation package.

Bell will pair CPU and bus upgrades

BY MICHAEL FITZGERALD
CW STAFF

VAN NUYS, Calif. — Clone-maker Bell Computer Systems said it would greet the new year with an upgradable personal computer that allows the user to upgrade the bus as well as the CPU.

Bell's line of systems, based on chips from Intel Corp. and Advanced Micro Devices, Inc., will offer processor upgradability from a 25-MHz AMD386SXL to an Intel 50-MHz I486DX. It will also give users the ability to see their peripherals run at the CPU speed, rather than the 8-MHz rate of data transfer permitted by the AT bus.

To do this, Bell's systems will use Santa Clara, Calif.-based Opti, Inc.'s Local/CPU Bus chip set. The catch for users is that existing peripherals do not take advantage of local-bus architectures and will not run faster, although Bell said its systems will have peripherals that will use the Opti system.

Bell expects to ship systems at the end of February. It will not sell CPU upgrades without an Opti chip set but has yet to set pricing for the systems.

One analyst said the bus system appears to make sense for users.

"Users will want to get maximum mileage out of an upgrade, performance enhancements and true productivity enhancement, and to the extent that you're limited by the bus, how much does an upgrade give you?" said Richard Zwetchkenbaum, senior hardware analyst at International Data Corp. in Framingham, Mass.

A Bell spokesman credited Intel with developing the local-bus concept back in 1988 but said vendors were reluctant to lock themselves into both Intel chips and an Intel architecture.

The secret of success is never being at a loss for words.
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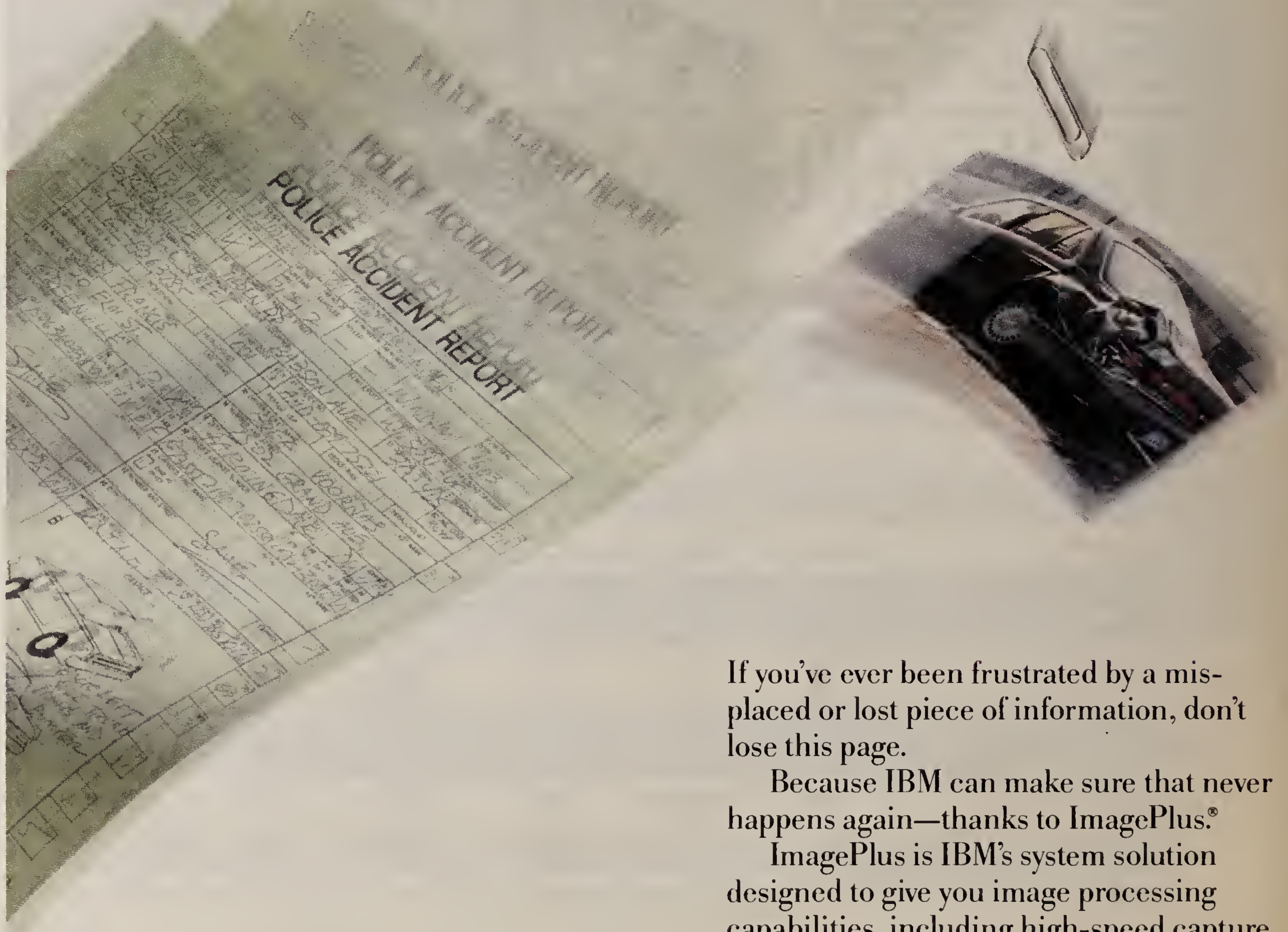

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NEW PRODUCTS

Systems

Altos Computer Systems has announced the first models in its System 4500 modular processor systems line.

System 4500 computers were designed specifically for use with Unix. All systems are based on the Extended Industry Standard Architecture.

A model with an Intel Corp. 20-MHz I486SX processor costs approximately $9,400.

Altos Computer Systems
2641 Orchard Pkwy.
San Jose, Calif. 95134
(408) 946-6700

Peripherals

Novadyne Computer Systems, Inc. has created a serial port expansion system for Sun Microsystems, Inc. workstations.

The Novaport Asynch Expander comes in two versions. The desktop model ($2,995) encompasses four eight-port asynchronous controllers, connecting up to 32 serial devices through one Sbus slot.

The deskside model ($5,595) includes eight eight-port controllers.

Novadyne Computer Systems
1700 E. St. Andrew Place
Santa Ana, Calif. 92705
(714) 566-2000

Seiko Instruments USA, Inc. has developed the Personal Colorpoint color desktop printer.

The 300-dot/in. thermal transfer printer can print a color page in less than two minutes, the company said. It is compatible with personal computers, Apple Computer, Inc. Macintoshes and Unix-based workstations.

Pricing starts at $3,999.

A model with a reduced instruction set computing processor and Adobe Systems, Inc. Postscript compatibility is available for $4,999.

Seiko Instruments USA
1130 Ringwood Court
San Jose, Calif. 95131
(408) 922-5800

Radius, Inc. has announced the Precisioncolor Display/19, a multifrequency monitor for personal computers and Apple Computer, Inc. Macintoshes.

The 19-in. display product offers a two-page display with 24-bit color, .31mm dot pitch and a 72-Hz noninterlace refresh rate. It supports up to 16.7 million colors, the company said.

The PC version, which works with the Radius SVGA Multiview graphics card, supports resolutions that range from 320 by 200 pixels to 1,280 by 960 pixels.

The price is $2,499.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
(408) 434-1010

Alacrity Systems, Inc. has begun shipping the Desktop Document Manager (DDM).

The product allows personal computer users running Microsoft Corp.'s Windows to photocopy, fax, store and retrieve electronic documents. The Alacrity DDM consists of a suite of software utilities and an add-in board with a graphics coprocessor and 6M bytes of memory.

The DDM is used in conjunction with a scanner and a laser printer.

According to the company, the DDM also speeds printing from any Windows application by as much as 10 times.

The product costs $1,995.

Alacrity Systems
43 Newburg Road
Hackettstown, N.J. 07840
(908) 813-2400

Storage

Everex Systems, Inc. has announced a 3½-in. small computer systems interface tape backup system that provides 560M bytes of storage and 32M byte/min. performance.

The Excel 560 is compatible with industry ¼-in. cartridge standards including QIC-121, according to the company. It includes the company's Stape software with menu-driven, file-by-file backup capability.

An internal model with one minicartridge and all necessary cabling costs $1,579. An external Excel 560 is priced at $1,729.

Everex Systems
48431 Milmont Drive
Fremont, Calif. 94538
(415) 498-1111

Development tools

Dolphin Software has created two software packages for use with C language and C++ compilers.

The Dolphin C Toolkit incorporates 225 C language functions pertaining to date, time, string, disk, file and printer functions. It enables users to save values in .EXE files.

The toolkit costs $149.

The Far Memory Manager and Debugging Library enables programmers to access most of the 640K bytes of conventional memory. It includes a debugging log that optionally records all far-memory operations, the company said. It is priced at $99.

The products can be purchased together for $238.

Dolphin Software
48 Shattuck Square #147
Berkeley, Calif. 94704
(510) 464-3009

So they can't accidentally fall off your desk, slip behind your coffee mug or inadvertently end up in the wastepaper basket.

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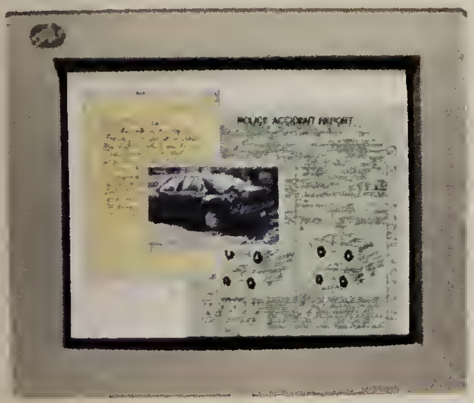

One of the many other conveniences: An image of a color photograph can be captured, stored and retrieved from the same folder that contains an image of a handwritten letter and other related documents.

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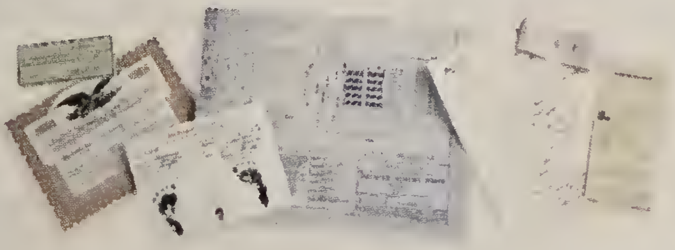

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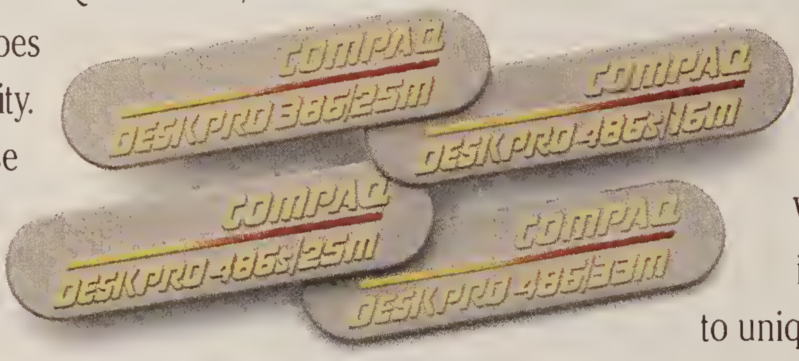

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Nobody else gives you all the advantages you get with the COMPAQ DESKPRO/M PCs.	COMPAQ DESKPRO/M FAMILY	ALR BUSINESS VEISA	AST PREMIUM II	DELL POWERLINE DE	IBM PS/2 MODEL 90
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2. Upgradable video without using an expansion slot	Yes	Yes	No	No	No
3. Separate I/O board for potential enhancements and ease of service	Yes	No	No	No	No
4. 14 levels of security including cable-lock provision	Yes	No	No	No	No
5. System configuration and ID number available in memory and accessible remotely	Yes	No	No	No	Yes
6. Power supply adequate for all expansion needs	240w	150w	145w	220w	194w

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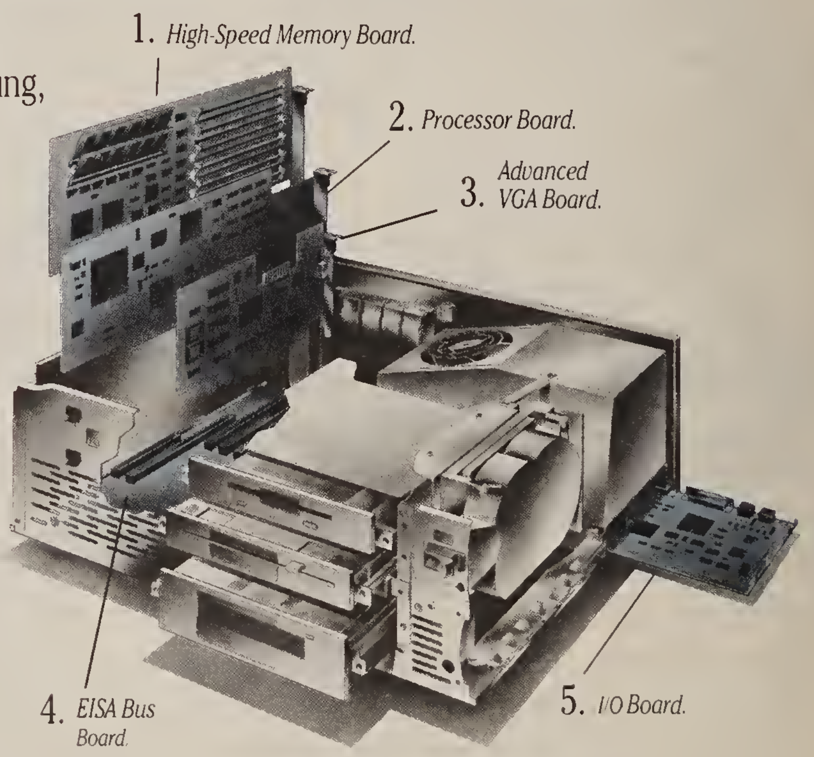

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NETWORKING

NETWORK SHORTS

NCR offers POS gear

NCR Corp. recently announced a new point-of-sale workstation that can work with a wireless local-area network. Members of the the NCR 5100 family occupy half the space of traditional personal computers, according to NCR. The company said up to 11 cables per work area can be eliminated if the device is used with NCR's optional Wavelan wireless LAN. The 5100 systems use Intel Corp.'s 386, 16-MHz chip and measure 11½ by 17 by 6½ inches.

Mainlan, Inc. in Dallas said it is shipping a low-end LAN operating system for $199 per node that includes a network interface card, software and cabling. The LAN, which targets small networks, is said to support MS-DOS and DOS/Windows clients and includes peer-to-peer sharing of DOS and DOS/Windows network applications and electronic mail.

AT&T's E-mail unit has signed an agreement to co-market Unisys Corp.'s Unix V-based electronic data interchange package. AT&T Easylink Services will recommend the Unisys software, called EaDIplus, to customers needing to integrate existing applications with EDI through an open systems platform.

Telecom managers unsure about SMDS

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Many telecommunications managers have yet to see how Switched Multimegabit Data Service (SMDS) might fit into their wide-area networking schemes. The impasse seems to stem from SMDS' current lack of availability, along with a deficit of marketing moves by local telephone companies to educate users about how SMDS differs from the much-touted frame-relay technology.

"I know what the acronym 'SMDS' stands for, but we have not seen any vendor — and that's a capital A-N-Y — coming to us about it," said Jess Reed, assistant vice president of telecommunications at Geico Corp., an insurance firm based in Washington, D.C. Geico is implementing a private frame-relay network.

SMDS is a public-switched wide-area data service slated to start oozing out of the regional Bell operating companies in the first quarter of next year at T1 speeds within service regions. According to carrier announcements made this fall, SMDS should be available in about 30 U.S. cities by year's end.

Making the connection

Connecting the pockets of SMDS is a major issue for users hearing similar characteristics and applications linked to both SMDS and frame relay. The Bell companies are restricted to offering local services and must depend on long-distance carriers to interconnect them in national and international configurations.

"I understand that SMDS is a local offering, so I'm not sure how that would fit with a national organization such as ours," said Roger Shjarback, project leader of telecommunications at Hoechst-Celanese Corp., a pharmaceuticals company in Bridgewater, N.J. The firm is deploying a hybrid public/private frame-relay network.

To date, no official announcements have been made by long-distance carriers about supporting SMDS, although MCI Communications Corp. and AT&T are deploying SMDS-capable switches in their central offices.

Frame relay — a fast, simple form of packet switching — does not have the ubiquity limitation that SMDS currently does. Frame relay is already offered both nationally and internationally by wide-area public carriers as well as on private networking equipment.

However, the "connectionless" nature of cell-based SMDS may actually suit the local-area network interconnections often cited as the "killer" application for frame relay better than the SMDS competitor, according to

Continued on page 52

Throwing the switch

*Carrier SMDS deployment plans by year-end 1992**

Company	Number of cities
Ameritech	[illegible]
Bell Atlantic	5 - 6
BellSouth	[illegible]
GTE	3 - 5
Nynex	[illegible]
Pacific Bell	6 - 7
Southwestern Bell	[illegible]
US West	9

*SMDS could reach 30 cities by the end of next year, although it is not yet clear how those islands will be linked

Source: SMDS Interest Group, Interop '91
CW Chart: Michael Siggins

Users wary of Novell management tool

BY ELISABETH HORWITT
CW STAFF

PROVO, Utah — Novell, Inc. threw what some users may consider a curveball when it announced its distributed Netware management system late last month.

While the product does meet some long-standing user needs, Novell's decision to base it on IBM's OS/2 Version 2.0 is likely to draw some user resistance, according to Tom Wood, senior industry analyst at Business Research Group, a Newton, Mass.-based consultancy.

Novell has been hinting for some time that it would be announcing a graphics-based, integrated management system for distributed Netware nodes. "Before, when Novell said it had network management, it really meant management of a single Netware server," Wood said. A network manager at a terminal would need to log on to each server in turn to get information about what was happening on each local-area network, he explained.

In contrast, Novell's Netware Management Map is said to track nodes automatically across multiple Netware LANs and display their status on a graphical user interface based on IBM's Presentation Manager. The product identifies active nodes on the network and "paints a map" depicting those nodes on a corporatewide network, according to John Edwards, Novell's director of marketing.

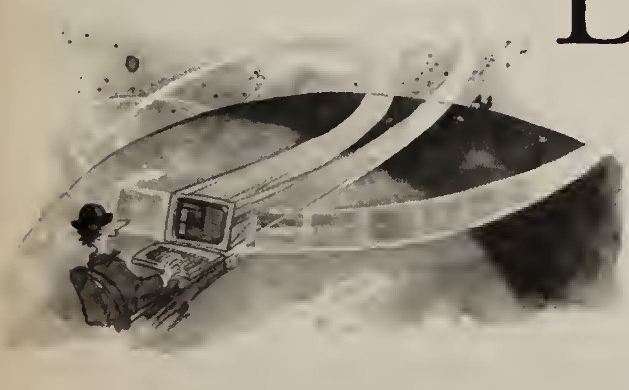
If a system fails or its performance degrades, its icon on the screen changes color. Then the administrator can position the mouse over the icon, zoom in to get more specific information about the ailing node and "take proactive steps, hopefully long before users call," Edwards said.

In addition, the system collects configuration information, such as what version of DOS or IPX a workstation is using or the number of packets it transmits within a certain time period. It then stores the information in a Novell Btrieve database for later retrieval and analysis, he said.

The above system "sounds very good, particularly when it comes to getting an inventory of devices on the network and a picture of the network's health," said Brian Keller, a network specialist at a major insurance company.

Keller said he also likes the idea of collecting configuration

Continued on page 50



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Greyhound drives wide-area networking

ON SITE

BY JOANIE M. WEXLER
CW STAFF

DALLAS — The postbankruptcy era at Greyhound Lines, Inc. has seen the bus company economize by scattering its corporate headquarters among several leased-office sites. The move has forced the firm to implement wide-area networks that must be continually cost-justified to a frugal upper management, senior network analyst Terry Davis said.

The justification process remains ongoing because mainframe-oriented senior managers have trouble understanding the nature of local-area network traffic, which requires more bandwidth than terminal-to-host connections, Davis explained.

Davis said he has a wish list of three key functions that would help him increase network efficiency and provide quantifiable bandwidth utilization fodder for his management presentations:

- The ability of his Crosscomm Corp. remote bridges to blend his IBM Systems Network Architecture (SNA) and Novell, Inc. Netware traffic.
- The delivery of Novell's "burst-mode" IPX, a planned efficiency tweak to the Netware communications protocol.
- A network management system to provide him with bandwidth utilization statistics on his T1 backbone.

Currently, "we don't have a method to physically show why we need full T1s among our locations," Davis explained. "Our senior management doesn't understand [LAN traffic] very well. They're used to the mainframe world where you can support hundreds of dumb terminals across a 56K bit/sec. line just fine."

Justifying the cost

For now, Davis said the only way to justify his T1 link is to tell management that the company can back up its weekly 4.5G bytes of data over it in 24 hours. Using a 56K bit/sec. line, the process takes an unacceptable three days, he said. Davis is unable to gather T1 statistics from a multiplexer because he does not own his own equipment.

Davis said he could get better use of his T1 bandwidth with the router and IPX developments on his wish list. He explained that LAN packets such as Netware do not sequentially use multiple channels on a T1 line as terminal traffic does.

"If one terminal uses one channel, the next terminal communicates across the next channel. LAN packets use one route only," though they need the full 1.5M bit/sec. T1 bandwidth when they do transmit, he explained.

Currently, Greyhound divides its wide-area traffic into two "lanes," dedicating half the T1 pipe from corporate headquarters in Dallas to the Des Moines, Iowa, data center to SNA and the other to LAN traffic.

This is a fairly common tactic, according to Janet L. Hyland, director of network strategy research at Forrester Research, Inc., a consultancy in Cambridge, Mass.

However, "the problem is that one channel could be empty while another is overflowing. So users are looking for a different solution where packets from both SNA and LAN environments are 'interleaved' over the same physical circuit," Hyland said.

Tad Witkowicz, president of Greyhound's router supplier, Marlboro, Mass.-based Crosscomm, said the firm is currently beta-testing a router feature that combines the LAN and SNA traffic "so both of these packets get multiplexed onto the same T1 or other WAN circuit." Witkowicz said the feature will start shipping this month and that the technology works by converting SNA packets into LAN packets within the router and reversing the process at the other end of the link.

In addition, Novell's "burst-mode" IPX — expected before mid-1992 — would allow the router to save up LAN packets, then burst them efficiently down the wide-area link, Davis said. This would replace the current, slower scheme of waiting for acknowledgment of each single packet received before transmitting the next.

Stretching Version 3.11

A Novell spokesman said burst-mode IPX is "currently being tested by Novell and a few customers" as an extension to Netware Version 3.11 and "focuses on WAN performance." He said routers currently supporting IPX will not have to be upgraded and that it has not been determined whether users will have to pay for the feature.

Greyhound's manager of distributed systems, Meg Frantz, indicated that the wide-area networking issues facing the company are apt to burgeon.

Pending projects include the expansion of the bus company's nationwide reservations system "so you can go into a 7-Eleven [or other locations] and buy a ticket. That requires access to nationwide schedules and pricing in more places," she said.

Late '91 flurry strikes LAN management field

BY ELISABETH HORWITT
CW STAFF

Novell, Inc.'s announcement of Netware Management Map was only one of several promising developments in the local-area network management arena that took place just before the closing of 1991. Other key announcements included the following:

- Ungermann-Bass, Inc. (UB) announced that it had purchased a bare majority share (50.1%) of up-and-coming network hub and LAN management vendor Networth, Inc.

Under the agreement, both companies will continue to sell their respective products, but Networth will "port a lot of our technology into UB's systems," Networth spokesman Kerry Wood said. The companies make a good complement, with Networth targeting departmental LANs and UB focusing on the international, enterprisewide LAN integration market.

While UB has announced no definite plans for porting Networth's Netware LAN management technology into its own products, "they have said our closeness to Netware is one of our attractions," a Networth spokesman said.

- The Internet Engineering Task Force (IETF) began working on a Token Ring version of the Remote Network Monitor (Rmon) protocol. Rmon is a de facto industry standard that defines how various LAN monitors and protocol analyzers can send information to a central network management workstation — generally one running Simple Network Management Protocol (SNMP).

An Ethernet version of Rmon is close to finalization by IETF, and several vendors have already announced products that support the protocol. Right now, Token Ring management systems are proprietary. A Token Ring Rmon would let the same SNMP workstation manage both sides of the network house, providing the protocol gains support from leading vendors.

- IBM announced a new version of its Transmission Control Protocol/Internet Protocol (TCP/IP) software for VM, which is said to include SNMP support for IBM's 3172 controller. This, in turn, will enable users to manage the 3172's Fiber Distributed Data Interface connections via a host-based SNMP management system.

The new version introduces a TCP/IP-based client/server database system. The remote procedure call-based system is said to allow IBM RISC System/6000 or Sun Microsystems, Inc. workstations to query a VM Structured Query Language/Data System VM database.

Users wary of Novell management tool

CONTINUED FROM PAGE 49

information in a Btrieve database, which can then be accessed by a variety of third-party reporting and analysis packages.

The insurance company has been seeking a management system for its Netware installation but has balked at the pricing of sophisticated protocol analyzers such as Network General Corp.'s Sniffer, Keller said. "We see a system that costs no more than 10% of the total cost of a LAN site as cost-effective network management," he said.

This makes Novell's pricing particularly attractive, he added. Netware Management Map, along with the recently announced Netware Requester for OS/2 Version 2.0, is bundled together as a single package dubbed Netware Services for OS/2 and is priced at $200 for a corporatewide site license, Novell said.

Echlin, Inc., a manufacturing firm that runs all of its corporate applications on Netware, is "cautiously interested" in Novell's new product, according to Hock, the firm's director of information systems. However, "We're not too interested in OS/2," he added. "We see the future with [Microsoft Corp.'s] Windows and New Technology."

Keller's firm, in contrast, is not concerned about whether its LAN management system runs on DOS, OS/2 or Unix, he commented.

Novell does not plan to base all of its future Netware management products on OS/2, according to Edwards.

The OS/2 orientation of Novell's new management system is most likely to find favor with companies using IBM mainframes as LAN servers, Wood predicted. He said a recent Business Research survey showed that such firms make up 23% of large and midsize companies.

"A lot of our clients are saying one of the most important things to do is integrate their LANs with the mainframe as a first step toward downsizing," Wood said.

Netware Management Map can collect information about almost anything that handles Novell's SPX/IPX protocol, including cable segments, Netware 2.X and 3.X servers, OS/2, MS-DOS and Microsoft Windows workstations and bridges and routers, Edwards said.

Netware Services for OS/2 is scheduled for availability when IBM's OS/2 Version 2.0 ships. That date is now set for March, IBM said.

Plugging the holes?

Novell's Netware Management Map fills some, but by no means all, of the gaps in the LAN vendor's integrated network management strategy.

Current product capabilities:

- An IBM Presentation Manager-based graphical user interface that shows status of distributed Netware nodes through color coding, with zoom-in capabilities to obtain detailed status information.
- Automatic "discovery" of all active nodes across a distributed corporate LAN configuration and plotting of their position on a topographical map.
- Ongoing monitoring of traffic and configurations of distributed LAN systems.
- Storage of statistics in a Btrieve database for later analysis.

In the works:

- The ability for the user to set thresholds, such as error or traffic levels, which, if exceeded, would automatically trigger alarms.
- Netware management products on platforms other than OS/2.
- Integration with Novell's protocol analyzer, Lantern.
- Analysis of levels of Netware CPU and disk use.

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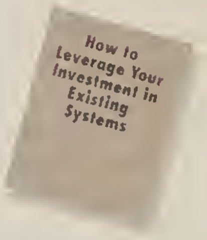

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CPW

Ameritech takes aim with AIN trials

BY ELLIS BOOKER
CW STAFF

CHICAGO — Two years ago, Ameritech became the first of the regional Bell holding companies to announce its Advanced Intelligent Network (AIN) plans. In early December, it took the lead again, becoming the first to announce AIN customer trials.

However, commercial availability of AIN-based services in Ameritech's five-state region is still "a few years away," according to Ameritech.

AIN calls for the deployment of computer databases and intelligent switches throughout the phone network. These pieces work together to route customer calls based on information stored in a database.

For example, calls can be routed depending on criteria such as the time of day, or customers can arrange for simplified, wide-area dialing plans for outgoing calls.

The next iteration of AIN, expected in the 1997 time frame, will tightly integrate this approach with the administrative and billing systems used by phone companies. This should dramatically speed up the hookup, disconnection or modification of phone service — what telephone companies call "service provisioning."

The AIN architecture consists of the following parts:

- The Service Switching Point (SSP), the network access point at which an incoming call is first processed. The SSP strips the call's out-of-band signaling information and sends this to the signal transfer point (STP).
- The STP recognizes whether this is an AIN call; if it is, the signaling information is transferred to the service control point (SCP).
- The SCP, in essence a central database, references the Service Management System, a routing database where additional details for how the call should be handled are stored.

The entire process takes a fraction of a second.

Continental Bank Corp. and American Drug Stores, both based in Chicago, will participate in Ameritech's AIN technical trial. The two will test a variety of call routing and forwarding, call blocking and simplified extension dialing capabilities.

Compuserve gives CIM 2.0 more search, flag functions

BY ELLIS BOOKER
CW STAFF

COLUMBUS, Ohio — Compuserve, Inc. recently introduced the latest version of its Compuserve Information Manager (CIM), a windowed front end to the Compuserve Information Service.

Like its predecessor, CIM Version 2.0 tries to make navigating through Compuserve's hundreds of networked databases and on-line services less intimidating to first-time users. Compuserve officials said they estimated that there are some 150,000 copies of CIM for MS-DOS and 45,000 copies for the Apple Computer, Inc. Macintosh in the marketplace today.

Some of the changes in CIM 2.0 are cosmetic, such as the ability to resize and reshape CIM's windows and preserve window preferences between on-line sessions. The program also adds some functions in the searching and "flagging" of files in Compuserve's numerous on-line forum libraries.

For instance, users of the Executive News Service can establish preferences and instruct the on-line service to clip and retain stories on particular subjects. When the user logs on, the clips are ready to be read or downloaded. Similarly, users can instruct the program to automatically track their stock portfolios.

In addition, forum messages can now be downloaded all at once, an improvement over CIM 1.3, which required that messages be captured individually.

Another option automatically searches for marked files and then disconnects from the service once the last of these files has been downloaded.

An upgrade to CIM 2.0 can be downloaded on-line by current Compuserve members; users can also order the shrink-wrapped kit for a nominal fee. Starting in the spring, CIM 2.0 will be bundled with the basic $49.95 Compuserve membership, which comes with a $25 usage credit.

The DOS program requires 640K bytes of memory, a Hayes-compatible modem, a hard drive and DOS Version 2.1 or higher.

Compuserve officials also promise a Windows 3.0 implementation of CIM sometime later this summer or early fall.

Telecom managers unsure about SMDS

CONTINUED FROM PAGE 49

Jeff Stone, vice president at Infonetics Research, Inc., a consulting firm based in San Jose, Calif.

He said SMDS's packet-by-packet routing scheme serves as a better LAN extension than frame relay. Point-to-point-oriented frame relay, like a telephone call, must establish a call path and then transmit all data over that nailed-up route.

Frame relay requires users to address data for specific sites, unlike the multipoint-oriented SMDS, which allows on-the-fly networking, said Pierre Sibille, manager of data product-line management at Siemens Stromberg-Carlson in Boca Raton, Fla. Siemens makes the only frame-relay- and SMDS-capable central office switch generally available and is a member of both the Frame Relay Forum and SMDS Interest Group.

One SMDS drawback, Sibille acknowledged, will be that international SMDS is likely to be available only at T1 speeds, though the intercarrier specification of SMDS specifies 45M bit/sec. and 155M bit/sec. To date, there is no intercarrier specification for frame relay.

Demarcation lines

A recent survey by Boston consultancy The Yankee Group of 80 large companies showed that 54% plan to implement SMDS, compared with 72% planning to use frame relay. The discrepancy can largely be chalked up to user unfamiliarity with the as-yet nonexistent SMDS service, which offers the following advantages:

- SMDS as a LAN extender requires less configuration work on the part of the user.
- SMDS speeds will eventually reach 155M bit/sec., while frame relay will probably reach only T3 (45M bit/sec.).
- Monthly T1 carrier charges might be significantly cheaper than frame-relay charges. For example, Bell Atlantic Corp.'s current service trial is $500/month for T1 rates, compared with $2,000 to $3,000 per circuit per month for frame relay at T1 speeds.
- SMDS, an entire service description, is more far-reaching than frame relay. It includes specifications for collecting billing information, network management and security — issues that have been cited as areas of concern by users considering frame relay.

However, points in frame relay's favor include the following:

- Global service and equipment are currently available.
- It is simpler and cheaper to upgrade from existing T1 equipment to frame relay than to SMDS.
- Frame relay spans both public and private networks.
- Users can often upgrade multiplexing equipment to support frame relay. If they do not already have equipment installed, the investment is still about half (about $3,000 per site) that of the equipment needed to support SMDS.

JOANIE M. WEXLER

NEW PRODUCTS

Local-area networking software

Supertime, Inc. has started shipping Version 1.1 of Supertime, its groupware package.

Supertime includes a calendar, contact directories, electronic mail and project management features. The revision offers improved sales management features, including a call list integrated into the calendar module and an auto dialer. Text editing is also enhanced.

Supertime runs under DOS and a variety of network protocols. Pricing ranges from $295 for a single user to $85 per user for over 100 users.

Supertime
Suite 2206
2025 Sheppard Ave. E.
Willowdale, Ontario
M2J 1V7
(416) 499-3288

Network management

The AG Group has enhanced Localpeek.

Localpeek 1.1 debugs Localtalk networks. The new version displays additional network performance statistics and offers improved functionality for remote troubleshooting.

The software costs $495. Upgrades from previous versions cost $60.

The AG Group
Suite 202
2540 Camino Diablo
Walnut Creek, Calif. 94596
(510) 937-7900

Wide-area networking software

Morning Star Technologies, Inc. has released both synchronous and asynchronous versions of Point-to-Point Protocol (PPP) for The Santa Cruz Operation's SCO Unix.

PPP allows wide-area Transmission Control Protocol/Internet Protocol connections between local-area networks. The synchronous version supports communication rates up to T1. PPP features include packet filtering, TCP header compression, on-demand dialing and inactivity disconnect.

Pricing for the SCO Unix version of PPP is $795 for a single-workstation license.

Morning Star Technologies
1760 Zollinger Road
Columbus, Ohio 43221
(614) 451-1883

Micro-to-micro

A version of Carbon Copy Plus for the Microsoft Corp. Windows 3.0 platform has been released by Microcom, Inc.

The product offers file-transfer capabilities and remote control of another personal computer running Windows 3.0. It also includes a "chat" function.

The price is $199.

Microcom
500 River Ridge Road
Norwood, Mass. 02062
(617) 551-1000

Electronic mail

Folio Corp. has announced Mailbag, an electronic mail storage-and-retrieval system for Novell, Inc. Netware local-area networks.

Mailbag categorizes and archives messages from common E-mail packages including Microsoft Corp.'s Mail, Lotus Development Corp.'s CC:Mail and Wordperfect Corp.'s Wordperfect Office.

The product is available immediately and costs $295 per 25-user license.

Folio
Suite 150
2155 N. Freedom Blvd.
Provo, Utah 84604
(801) 375-3700

NEW PRODUCTS

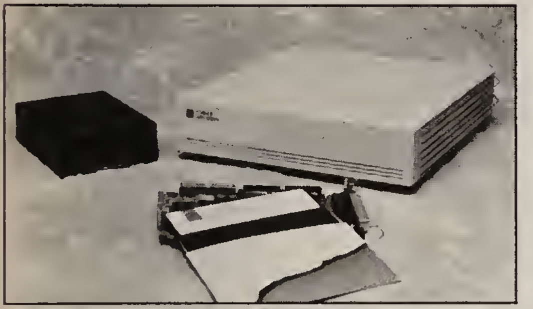
Local-area networking hardware

A new set of 10Base-T network hubs has been announced by 3Com Corp.

The Linkbuilder 10BT products are 12-port hubs that can be interconnected to support up to 48 10Base-T nodes as a single logical repeater. They also allow users to hot-swap a BNC or fiber backbone port.

The Linkbuilder 10BT costs approximately $90 per port. An intelligent version supporting Simple Network Management Protocol costs approximately $110 per port. A single-port BNC module costs $149.

3Com
3165 Kifer Road
Santa Clara, Calif. 95052
(408) 562-6400



Storage Dimensions' Lanstor EL *can control up to seven disk drives*

Storage Dimensions, Inc. has introduced the Lanstor EL series of storage products for small to midsize Novell, Inc. Netware local-area networks.

The Lanstor EL line includes a small computer systems interface adapter that can control up to seven disk drives. Drives in the product line offer formatted capacities of 213M, 339M and 535M bytes. Data transfer rates are as high as 5M byte/sec. The system can be configured to provide more than 3G bytes of storage.

Pricing starts at $1,825 for an internal 213M-byte subsystem.

A Data Fusion option is available for Lanstor EL systems running under Netware 3.11. Data Fusion reduces rotational latency by fusing small data requests into a single block, the company said. Data Fusion costs $249.

Storage Dimensions
1656 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 954-0710

Gateways, bridges, routers

Intellicom, Inc. has announced a low-cost, high-performance local Ethernet bridge.

The Quicknet 6000 bridge examines more than 27,000 packet/sec. and forwards more than 14,700 packet/sec. It is protocol independent, Intellicom said, and supports the Simple Network Management Protocol. The bridge also automatically learns the network configuration and stores up to 10,000 Internet Protocol addresses.

Quicknet 6000 costs $1,975.

Intellicom
20415 Nordhoff St.
Chatsworth, Calif. 91311
(818) 407-3900

Mcdata Corp. has announced the availability of its enhanced Linkmaster 7100 Network Controller.

The Linkmaster 7100 is an IBM 3174-compatible device with expanded local-area network support. The product offers 10 new features including Systems Network Architecture gateway connectivity for Ethernet, concurrent SNA and non-SNA channel protocols on the same channel and multiple host protocol combinations.

Pricing ranges from $5,635 for a 16-port, single-host controller to $29,935 for a 128-port, single-channel version.

Mcdata
310 Interlocken Pkwy.
Broomfield, Colo. 80021
(303) 460-9200

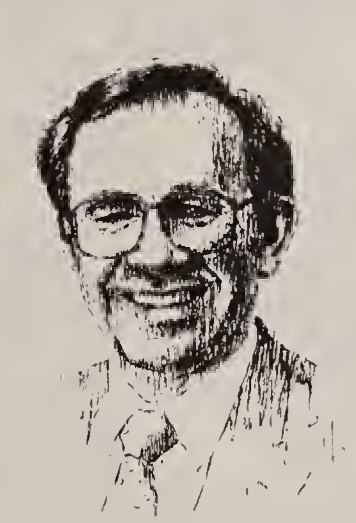
Micro-to-host

Visionware Ltd. has ported its PC-Connect product to the VMS operating system.

PC-Connect allows personal computers running Microsoft Corp.'s Windows environment to communicate with VMS systems as well as Unix-based systems. It enables Windows to serve as a front end for file transfer and cut-and-paste operations. The product supports Dynamic Data Exchange links between Windows and VMS applications and includes a VMS version of the Windows Notepad, Visionware reported.

Pricing starts at approximately $2,000 for up to eight users. A number of site license options are available.

Visionware
57 Cardigan Lane
Leeds LS4 2LE
England
(011-44) 532-788858



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MANAGER'S JOURNAL

EXECUTIVE TRACK

J. Carryl Seaman III has been named chief information officer at **Homefed Bank** in San Diego, the seventh largest savings institution in the U.S., with assets of $15 billion. He is responsible for all information technology and the deposit back-office operations.

Seaman was most recently senior vice president of operations at the Sunbelt Savings Federal Savings Bank in Dallas for the past two years. He joined Sunbelt after two years as an account manager at Systematics, Inc.

Before that, Seaman spent 11 years at Republic Bank as senior vice president of operations in Lubbock, Texas, and in Dallas.

Seaman holds a bachelor's degree from Mississippi State University.

……

Bill Murray, director of information systems at **Tribune Broadcasting Co.** in Chicago, has been named to the parent Tribune Co.'s newly formed Technology Steering Committee.

The committee is charged with studying and planning for the strategic direction of technology across all Tribune lines of business. Tribune owns six major TV stations, four radio stations, three regional radio networks, seven newspapers and the Chicago Cubs.

……

Carl Esposito has been promoted to senior systems architect at **Merrill Lynch & Co.** in New York. He is responsible for managing the development of firmwide human resources databases on a two-tiered platform of IBM DB2 and Oracle Corp. client/server database management systems.

Esposito has been at Merrill Lynch for two years and was previously a systems architect. Before that, he was a manager of systems development at H. J. Heinz Co.

Esposito is president of the New York Oracle users group, publisher of the "Oracle User Resource" newsletter.

Esposito holds an MBA from the New York Institute of Technology and a certificate of advanced technology from Columbia University.

Fresh air beats Times Square

Reynolds IS chief Robert Wynn has no regrets about leaving the big city for Nevada

BY JIM NASH
CW STAFF

PROFILE: Robert Wynn

Hank de Lespinasse

Position: *IS manager at Reynolds Electrical & Engineering Co.*

Mission: *Organizing and directing a large staff committed to doing its own software development, operations and support*

Robert Wynn laughs loudly at the comparison of his life to the television show "Green Acres." It's funny, the information systems manager admits, because it's true.

Last October, Wynn, former manager of computer systems and planning at Manufacturers Hanover Trust Co. in New York, chucked "the mountains of Manhattan for the mountains of Nevada." Wynn now manages the information systems department at Reynolds Electrical & Engineering Co. in Las Vegas. Reynolds is a U.S. Department of Energy contractor that for 40 years has provided site construction and support for underground tests of nuclear warheads.

Wynn agrees the change he made is continental in size. "But the time for change was there. I needed to expand my career and my experience," Wynn says. "The East Coast was a negative experience."

Consolidations and mergers in the late 1980s were sweeping away those companies that had not already lost their economic edge, he notes, "and our revenue stream looked bad." With consolidation would come staff cutbacks, something in which the 18-year Manny Hanny veteran was loathe to participate.

Wynn left Manufacturers Hanover a year ago, only months ahead of its merger with Chemical Bank. He took what he considered a "bridge job," working with Binec Computer Services, a small New York consulting company catering to financial services firms. "But my love is systems management," he says, "and my objective was to become a CIO."

A graduate of Fordham University in New York, Wynn joined the Federal Reserve Bank in New York in 1969. There, he learned the particulars of financial communications equipment as a systems analyst.

Continued on page 56

New Year: It's high time for an IS makeover

BY CLINTON WILDER
CW STAFF

The new year. Time for questions, self-examination and New Year's resolutions that are put on the shelf to gather dust as soon as the first "drop everything" crisis lands on your desk.

One leading information systems consultant, however, suggests that letting resolutions languish this time around could be suicidal.

Calling 1992 "the year of introspection" for IS, N. Dean Meyer, president of NDMA, Inc. in Ridgefield, Conn., said the IS function must undergo a fundamental change in order to survive.

Meyer contends that somewhere in the ascendancy of the charismatic chief information officer, many IS organizations have lost sight of management fundamentals.

Without changing the organization to be responsive, cost-effective and aligned with the business, the CIO is doomed to failure in the eyes of senior management — and will become another CIO turnover casualty.

The 'better organization'

"Unlike in Japan, many Americans don't treat management as a science," Meyer said. "Anyone who talks a good game can make it to the top. But IS executives had better learn how to design better organizations."

The better organization is one in which the CIO has empowered both the technical specialists and end users in the business to make technology and budget decisions. A growing trend that NDMA and other firms support is placing business users in charge of IS budget prioritizing for their specific needs.

"The IS executive can never know enough to make all the decisions," Meyer said. "The introspective executive is not a decision maker but a culture maker, building an environment where people can make the best decisions."

To make the organization more responsive and to keep the budget watchdogs at bay in recessionary times, Meyer recommends cheaper IS projects with faster paybacks. He calls these "the golden apples.

"You could spend three years and $5 million to rewrite your whole customer information system for an eventual payback of $20 million," he said. "But there may be 100 opportunities for a $1 million payoff with a $10,000 investment in end-user computing. Focus on low-cost, high-payoff opportunities."

Such projects can help convince senior management that there is a return on investment (ROI) payoff from IS spending — and save the CIO's job.

Senior executives are "getting fed up when ROI is low and IS appears to be a necessary evil," Meyer said. "But at the same time, they are more computer-literate and more excited about the potential of technology. That combination is putting IS executives in trouble."

Fresh air beckoned to Reynolds' Wynn

CONTINUED FROM PAGE 55

Three years later, he left to teach computer science at a U.S. Department of Defense systems management school in Fort Belvoir, Va. Manufacturers Hanover lured him away in 1971 as a senior systems analyst.

It was a want ad in the *New York Times* that sent the 44-year-old westward. "All it said was that Reynolds in Las Vegas needed an IS manager," Wynn recalls. "All I saw was *Las Vegas*. 'Now there's a change,' I said. In a New York minute, here I was."

Reynolds, he learned, wanted change. "That's why they went outside the company for the search." Figuring he had nothing to lose, Wynn says, "I was bold in my responses. I'd give them very New York answers." He remembers saying point blank: "You have to be very customer-oriented even though you're part of the government."

"We never considered [Wynn] a gamble," says Ed Weintraub, executive vice president and department manager at Reynolds, who said he was not taken aback by Wynn's directness. Nor did Weintraub think it odd to be interviewing someone so seemingly foreign to Reynolds' culture.

"Bob had the management skills to plan, organize and direct a large staff," Weintraub says. And Manny Hanny's operation was similar in size to Reynolds'. Hiring him brought new blood to the company, Weintraub says, but that has been a side benefit to his capabilities.

Varied challenges

At Reynolds, Wynn supervises 150 employees and helps maintain an IS department committed to doing its own software development, computer operations and technical support. There are about 85 Digital Equipment Corp. Microvaxes, six VAX 8650, 8530 and 8700 mainframes as well as numerous Novell, Inc. networks with T1 links.

For all their contrasts, Wynn says there is remarkably little difference between the Reynolds shop and Manny Hanny's. Both strive for zero errors. In New York, the object was to maintain systems that managed massive amounts of money. In Nevada, IS maintains machines that manage mundane business applications — but the department also plays a crucial role in ensuring the safety of Reynolds employees and the surrounding environment (see story at right).

Wynn said he has no political qualms about the nuclear tests themselves. "This company does an unbelievable service to the Department of Defense, providing environmentally safe testing that ensures the safety of this nation," he says.

Overall, he says, he is acclimating well. "I do miss Manhattan from the point of Broadway shows," he says. "But I've seen James Brown, Tom Jones and other entertainers here. It's easy to meet people. It's kind of the same kind of melting pot as New York: lots of people from somewhere else."

As it happens, he sees other similarities between Manhattan and Las Vegas. "I pictured big city, lights, action," he explains, and that was what he found. "But it's a big city with a small-town sense to it."

It was the small-town feel that appealed most to him. Immediately upon arriving — in less time than it usually took him to find a parking space in Manhattan — Wynn had purchased his first Stetson hat and a pair of cowboy boots.

But when Wynn wants to remember how different this world really is from the high-rise towers of New York, all he has to do is drive out to the desert sites where Reynolds has conducted its testing for most of the nuclear age. Scrabble-covered purple mountains scrape the sky on the horizon, while around him stretches sun-blasted desert with occasional concentric circles marking test spots.

"The first time I was on the [testing] site, I thought I was on the moon," Wynn says.

Company town

For all the similarities Robert Wynn may find between his job maintaining systems at Manufacturers Hanover and Reynolds Electrical & Engineering, the role of the equipment differs enormously.

Besides monitoring radiation dosages accumulated by employees, Reynolds' systems also help run the tiny, private town of Mercury, Nev. Mercury was built by the Department of Energy to house test-site employees. It looks like a miniature village shimmering miles behind a barbed wire fence in the Nevada desert.

For all intents and purposes, it is a giant hotel and motor pool. Employees rent homes for nominal fees and are provided with vehicles. Reynolds, in fact, manages about 5,500 autos, the largest nonmilitary pool in the nation.

The company's DEC VAX computers maintain databases that note who is scheduled to arrive in Mercury, which house they will rent, what, if any, transportation they will need and how long they will stay, Wynn explains. The computers go so far as to help schedule entertainment in the company town's theater and juggle food deliveries to its stores.

JIM NASH

MANAGEMENT SHORTS

Poll: 36% planning to hire

Searching for a ray of economic hope? There may be one in the latest survey of hiring intentions conducted by **Compusearch**, the data processing division of Cleveland-based personnel search firm Management Recruiters International, Inc.

Compusearch polled 400 firms and found that 35.8% plan to increase their information systems staffs in the first half of 1992. This represents a 6.9% jump over projections for the last half of 1991.

Not surprisingly, however, there is some bad news: 13.8% of firms polled said they plan to reduce IS staff in the same period, an increase of 1.2% over the second half of 1991. About half the firms (50.3%) plan to maintain current staff sizes in the next six months.

The most aggressive IS hiring will be in the health care industry, where 59.3% of the firms polled said they would increase IS hiring. The data processing industry was next, with 43.9% planning to beef up IS staffs, followed by the food industry at 35.5% and fabricated metal products at 32%.

The Association for Computer Operations Management (AFCOM) will present its first "Data Center Manager of the Year" award for excellence in data center management. The award will be presented at a special awards banquet during AFCOM's 12th annual conference and trade show in Nashville on April 29.

Managers directly responsible for the management of a computer operations department are eligible for nomination. Candidates can be nominated by professional colleagues and fellow employees, but not vendors who sell products to the data center.

Nominations should be submitted to AFCOM, 742 E. Chapman Ave., Orange, Calif. 92666.

Profit-Oriented Systems Planning Program (POSPP), an IS research consortium, will hold its winter meeting Feb. 3-5 in San Diego. Nonmembers of Carrollton, Texas-based POSPP are invited to attend but must pay a higher fee.

The conference will cover a range of topics including using IS to seize business opportunities, improving return on investment through re-engineering and dealing with shifting technology environments.

Speakers include Thomas R. Gaughan, senior vice president and chief information officer at Home Insurance Co.

CALENDAR

JAN. 26-FEB. 1

The AS/400 Help Systems Operations Automation User Conference. Orlando, Fla., Jan. 27-30 — Contact: Help Systems, Inc., Minnetonka, Minn. (612) 933-0609.

Improving Productivity in Systems Development. Phoenix, Jan. 27-31 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-5929.

Comnet '92. Washington, D.C., Jan. 27-31 — Contact: Rachel Winett, World Expo Corp., Framingham, Mass. (508) 879-6700.

Improving Programmer Productivity Seminar. Washington, D.C., Jan. 28 — Contact: James E. White, Computer Consulting, Washington, D.C. (202) 544-8374.

Computer Graphics Show. New York, Jan. 28-30 — Contact: MIJO, Inc., Silver Spring, Md. (301) 846-7795.

Windows & OS/2 Conference. San Jose, Calif., Jan. 28-30 — Contact: Stan Politi, CM Ventures, Inc., Emeryville, Calif. (510) 601-5000.

Infotext. Las Vegas, Jan. 28-30 — Contact: Infotext Publishing, Inc., Capistrano Beach, Calif. (714) 493-2434.

12th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 28-31 — Contact: Barabara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

FEB. 2-8

Western Communications Forum. Anaheim, Calif., Feb. 3-5 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Information Management Conference. New York, Feb. 4-5 — Contact: The Conference Board, New York, N.Y. (212) 759-0900.

Re-engineering: The Implementation Perspective. Dallas, Feb. 4-6 — Contact: Hammer & Co., Cambridge, Mass. (617) 354-5555.

Microtrends. Washington, D.C., Feb. 5-6 — Contact: The International Communications Industries Association, Fairfax, Va. (703) 273-7200.

FEB. 9-15

Computer Graphics '92. Orlando, Fla., Feb. 10-12 — Contact: Sheila A. McDonald, Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Networld '92. Boston, Feb. 11-13 — Contact: Annie Z. Scully, Bruno Blenheim Associates, Englewood Cliffs, N.J. (201) 596-8542.

Dexpo. Calgary, Alberta, Feb. 11-13 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

FEB. 16-22

Information Security Managers Symposium. San Diego, Feb. 18-20 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

CASE World Conference & Exposition. Santa Clara, Calif., Feb. 18-20 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Seybold Seminars '92. Boston, Feb. 18-21 — Contact: Beth Sadler, Seybold Seminars, Malibu, Calif. (213) 457-5850.

FEB. 23-29

Annual Platforms For Computing (PC) Forum. Tucson, Ariz., Feb. 23-26 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

1992 International Help Desk Conference. New Orleans, Feb. 23-27 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Software Development Spring '92. Santa Clara, Calif., Feb. 23-28 — Contact: Miller Freeman Publications, Inc., Santa Clara, Calif. (415) 905-2414.

Synoptics Users Group Conference. San Francisco, Feb. 24-26 — Contact: Amparo Lago, Synoptics Users Group, Santa Clara, Calif. (408) 764-1073.

Macapp Conference. Orlando, Fla., Feb. 24-28 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6946.

MARCH 1-7

Share '92. Anaheim, Calif., March 1-6 — Contact: Pam Schur, Share headquarters, Chicago, Ill. (312) 822-0932.

Unix & Open Systems. Toronto, March 4-5 — Contact: Kal Juman, Datapro/Canada, North York, Ontario (416) 496-3131.

Computers in Libraries. Washington, D.C., March 4-7 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

MARCH 8-15

Electronic Data Processing. Orlando, Fla., March 9-11 — Contact: Michael I. Sobol, MIS Training Institute, Framingham, Mass. (508) 879-7999.

CAD & Engineering Workstations '92 and Business Graphics. Anaheim, Calif., March 9-12 — Contact: National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Getting Maximum Business Value From Technology. New York, March 10-11 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0290.

For IS, quality is 'job none'

U.S. businesses are abuzz with talk of quality, but surprisingly few look to information systems as a means to achieve it

David Joel

Miles, Inc.'s John Tremse, *a quality leader at the pharmaceuticals firm, says IS can have an impact if it puts business needs first*

BY ALICE LAPLANTE

Three years ago, Carrier Corp. wasn't exactly a hotbed of quality. The Syracuse, N.Y.-based manufacturing giant faced eroding market share and — perhaps worse — an increasing perception that it was not communicating effectively with customers.

Small wonder: A manual order-entry system designed to match products with customers was plagued with problems, resulting in a 70% error rate. The system handling one of Carrier's bread-and-butter products, a commercial air-conditioning unit, had so many steps that mistakes were all but inevitable.

Still worse, says Paul Burkhart, manager of applications development at Carrier, errors sometimes went undetected until the end of the manufacturing line, where workers would discover a wrong coil or similar problem. Worst of all, big mistakes would occasionally reach customers.

In 1988, Carrier said "enough" and started a Total Quality Management (TQM) program in which information technology would play a big role. Today, an expert system — developed using an IBM expert system shell on a 3090 mainframe, later converted to Aion Corp. technology — coordinates everything from sales to manufacturing, resulting in fewer errors, lower manufacturing costs and happier customers, Burkhart says.

In fact, Carrier management was so pleased with its first success using technology to beat a quality problem that it is now looking for new ways information systems can help streamline business processes.

Sadly, Carrier is a minority among U.S. businesses. Although quality is an oft-heard term, to date, few organizations have effectively harnessed information technology to improve the quality of their goods and services.

U.S. misses the connection

A recent joint study by Ernst & Young and the American Quality Foundation (AQF) found that only 22% of U.S. businesses believe technology is of "primary importance" in meeting quality goals — the lowest percentage of the four countries surveyed. In contrast, 49% of Japanese firms, 33% of German firms and 31% of Canadian firms saw technology as a key factor, says AQF President Joshua Hammond (see chart page 59).

The study jibes with a recent member survey taken by the Society for Information Management (SIM). Although the importance of quality rated 3.19 on a scale of 4.0, only 15% of the 580 IS executives responding felt it was their role to act as a supplier of technology to enable quality programs.

"The people introducing TQM to corporations all read the same business books and articles and concentrate on things like manufacturing and customer service," says Ted Prince, chief executive officer of the Computer Power Group, Inc. a New York-based consulting firm. "Virtually none of them are interested in IS."

That's a big (and ironic) mistake, Prince notes, because good information is a top concern of quality programs. "If you are trying to improve manufacturing, you need data . . . on what you are doing wrong, what you are doing right. Where are you going to compile that data? How are you going to analyze it, get it to the right people? Without the help of IS, it's an impossible task."

Carrier knew this when it had IS work with business management on the order-processing

Continued on page 58

LaPlante is a free-lance writer based in Palo Alto, Calif.

Role of IS in Quality

KEY POINTS

- ▶Quality is a popular buzzword in U.S. businesses, but few have effectively harnessed information technology.
- ▶Most IS quality efforts focus on improving internal processes, such as application development.
- ▶Americans place less faith in the ability of technology to improve quality than do Europeans or the Japanese.
- ▶Carrier Corp. is an exception. It slashed production costs by installing expert systems.
- ▶U.S. government agencies are starting to climb on board the quality bandwagon.
- ▶Quality pioneer Nashua Corp. shifted to local processing as the latest advance in quality programs, begun in the late 1970s.

QUOTABLE:

"The people introducing TQM to corporations all read the same business books and articles . . . Virtually none of them are interested in IS."

Ted Prince
Computer Power Group

Few U.S. businesses look to IS to achieve quality

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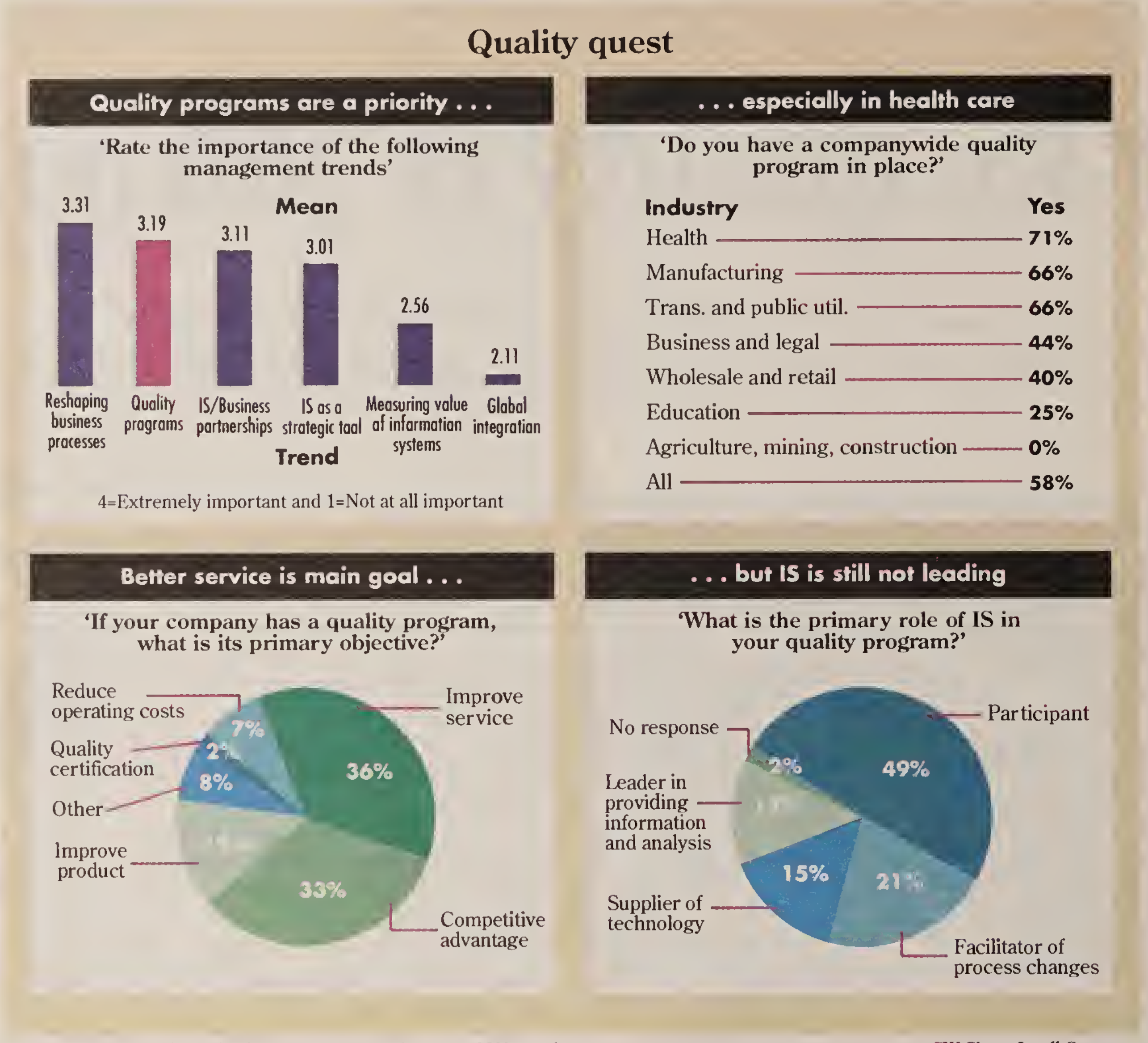


Source: Society for Information Management, annual survey of 581 members

CW Chart: Janell Genovese

problem. More often, however, an IS department participating in a TQM program focuses only on using quality techniques to examine and improve internal functions such as producing software applications. That's what nearly half of the SIM survey respondents said.

Quality experts and IS managers note that the two are, of course, related: Without a high-quality IS function, chances are slim that technology will be used well in a corporate quality program. Unfortunately, experts say the traditional definition of quality — minimizing defects while trying to conform to preestablished customer specifications — isn't very useful or helpful to most IS managers for several reasons:

- Few IS shops have identified their customers, much less asked them what they believe constitutes a high-quality IS product or service.
- Quality techniques or measurements have yet to be specifically adapted to IS functions.
- IS culture still tends to focus on individual performance and craft — the antithesis of a TQM program, which highlights group effort and routine functional processes.
- IS is still perceived by corporate management as being more concerned with technology than overall business efficiency.

New path for IS

Does all this mean that IS is doomed to count software bugs and that it will never make a meaningful contribution to corporate quality? Not at all, according to Computer Power Group's Prince and others. But, they say, most IS departments have a long way to go when it comes to planting quality in their own backyards and beyond.

A key first step is defining what quality means to IS. Most say that it means knowing exactly what customers want.

"Quality means changing from a technical focus to one that takes into account real business issues," says John Tremse, vice president of IS and logistics at pharmaceuticals firm Miles, Inc. in Elkhart, Ind.

For example, a customer service department might say it needs a printer that works 24 hours a day. In reality, the department is really expressing a business need — instant, uninterrupted service. Learning to translate technical requests into business needs is key, says Tremse, whose IS quality efforts launched him into a leadership role in his firm's quality effort.

Prince agrees: "Before an IS manager even thinks of quality in terms of counting bugs or of measuring function points of code, he or she needs to understand who the customers are and what will satisfy them. Don't even think of getting into the technical mumbo jumbo until you do that."

So how do you determine what customers want? Just ask, says Diane L. Beal, president of Quality Breakthroughs, a consulting firm in Brainerd, Minn. "For years in data processing, we were meeting requirements and specifications, but they weren't necessarily provided by the customer." That must change, she says, if quality is to blossom in IS and grow into the organization.

A good example is report generation. In many companies, thick reports are generated by IS, then blanketed across the organization. "General Electric has made enormous strides by asking the simple question, 'Who needs this report, and exactly what information do they need from it?' " AQF's Hammond says. In many cases, a one-page summary would be perfectly adequate, he adds.

Motorola, Inc., internationally recognized as a quality leader, took a similar tack in simplifying a common process. The company used information technology to slash the time needed for generating financial reporting from months to days. "The size of the reports has been whittled down to almost zero," Hammond notes.

Jim Allred, chairman of the American Executives for Manufacturing Excellence, notes that IS has traditionally given manufacturing executives historical data. To be really useful, he says, IS should focus on providing data that can really improve product quality.

"Usually the damage has already been done by the time senior management sees data provided by IS," says Allred, who is also chairman of Eskay Corp. in Bountiful, Utah. "In effect, you are reviewing problems that already occurred rather than using IS to avoid them."

Much more helpful to corporate quality efforts would be 100% accurate, real-time data *during* the manufacturing process.

Tom Bowman, quality man-

New studies examine relationship between quality and IS

Several landmark studies attempting to relate quality to technology concerns and issues are due by midyear.

The reports aim to provide IS managers with concrete evidence of what quality programs can and cannot do, specifically the following:

▶**The Society for Information Management** (SIM) will deliver results from a new study on the quality of IS at its annual 1992 conference. More than 50 firms participated as members of a working group for the 18-month study, which began in early 1990. The project has several aims, according to co-chairwoman Nancy Wendt, partner at the Winhall Group in Bloomfield, Conn. They include describing applications and technology that can help IS contribute to corporatewide Total Quality Management (TQM) programs.

▶**Ernst & Young's Center for Information Technology and Strategy** in Boston recently kicked off a program that focuses on quality in IS. "We want to see how leading IS organizations are applying quality tools," says Richard Swanborg, director of the TQM within IS program. Participants include AT&T, Eastman Kodak Co., Ameritech and Apple Computer, Inc.

▶This spring, IS managers will finally have hard numbers about how technology impacts bottom-line performance. **The American Quality Foundation**, in a joint study with **Ernst & Young**, is compiling the results of the technology portion of its international study on quality. Joshua Hammond, president of the American Quality Foundation, says a key goal of the study is to correlate quality practices with actual results. "We are very interested to see if there is a high correlation between the use of technology in quality programs and high-performance companies," Hammond says. "If there is, that's bad news for U.S. businesses, who have been lagging behind the Japanese."

……

The American Society of Quality Control (ASQC) is expected to release guidelines at its annual meeting in 1992. Solicited from ASQC members, the guidelines would be designed to help companies implementing automated quality information systems in computer-integrated manufacturing programs.

……

Black and Decker Corp.'s IS department has instituted a TQM initiative. The main goal of the initiative is to increase communication between IS and the other departments in the firm. Today, the firm is looking for TQM to generate better product yields [CW, July 15, 1991].

……

Wolf Advisory International Ltd. in Lancaster, Pa., offers a free questionnaire and quality rating audit for firms to gauge the effectiveness of their departments. The audit asks managers to agree or disagree with statements addressing such issues as user satisfaction, productivity, planning and training. For a copy of the audit, call Wolf at (717) 299-6653.

……

Austin, Texas-based **Sematech**, a consortium of 14 major U.S. semiconductor manufacturers, is focusing on quality as a means to alter the way competing firms interact. Keith C. Erickson was appointed the consortium's vice president and director of total quality, and he concentrates on the Partnering for Total Quality program there. He also supervises the implementation of Sematech's internal TQM program.

ager at General Tire & Rubber Co. in Charlotte, N.C., is doing just that. He's installing a local-area network that will give plant-floor operators real-time data on raw materials as they enter the factory.

Instead of depending on paper graphs periodically generated by a minicomputer, the new system will automatically alert operators of a bad batch so that operation can be shut down before many bad tires have been manufactured.

How are we doing?

Once customer requirements are identified, experts say measuring performance is the next critical step. While discussions continue about the best way to measure IS quality, most agree that collecting huge volumes of data is not the answer.

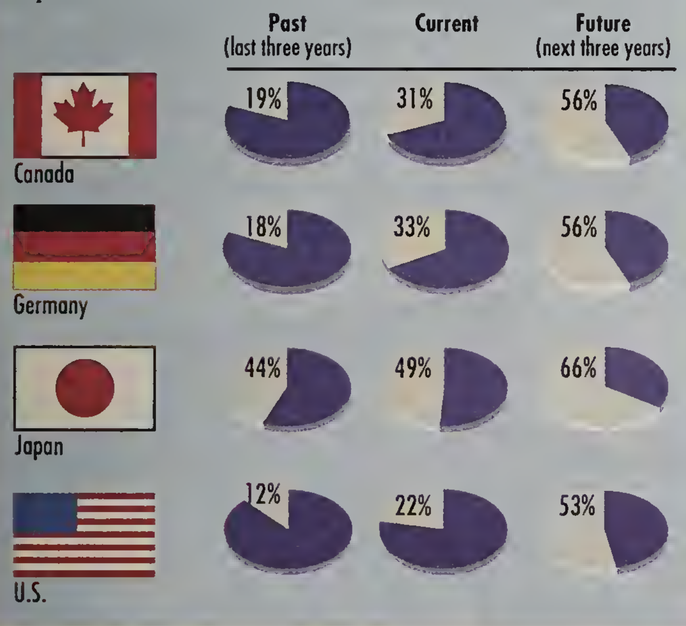
"Often, these are just collections of numbers, as opposed to data that can be used to make an improvement in a business process," says Aleta Holub, vice president of quality assurance at First National Bank in Chicago.

Holub says it isn't enough to simply count and compile errors or defects in a product or service, then issue a report. Instead, errors must be carefully broken down so that employees can actually take action and improve their work.

At Corning, Inc. in Corning, N.Y., a $3 billion firm that was a finalist in the 1989 Malcolm Baldrige National Quality Award Competition, quality is considered a strategic weapon. To this end, IS quality is measured by extensive surveys and interviews of both internal and external customers, according to Al Venette, manager of quality for IS.

A growing global role

A survey of more than 500 business sites indicates the importance of the use of technology in meeting customer expectations



Source: International Quality Study (Ernst & Young and the American Quality Foundation)
CW Chart: Janell Genovese

Over the past year, Venette says, Corning's IS department has been working on measuring customer satisfaction in two areas: project and direct-support services. IS groups conduct surveys and interviews and then summarize results for departmental IS managers.

"We've been measuring systems availability for ages and will continue to do so," Venette says. "But that doesn't always tell you if the users have been able to get the applications they want, when they want them, and if those applications have adequate response times."

Culture shock needed

IS organizations with a desire to help the corporate quality mission might do well to look at computing culture as well, experts advise. For instance, applications developers, whose self-perception is that of highly specialized craftsmen, are the antithesis of TQM philosophy.

"IS organizations have traditionally been made up of mavericks," notes Victor Schwinghamer, director of quality management support at First Data Resources, Inc., an Omaha-based credit-card transaction processing subsidiary of American Express Co. "People who stay up all night to fix systems problems have been viewed as heroes. Yet the emphasis instead should be on those unexciting individuals who never have to come in the middle of the night because they don't create any problems to begin with."

"The difference between a quality culture and a nonquality culture is the Mack truck test," Computer Power Group's Prince says. "If a Mack truck plows through your IS department, will you still be able to replicate quality efforts? Or if you lose certain individuals, will everything fall apart? If you can't pass this test, you don't have a quality shop."

Schwinghamer says another big problem in IS culture is the fear that reporting a bug or a quality defect reflects poorly on the individual worker. Changing such attitudes requires constant effort, says Schwinghamer, who works full-time at quality improvement and manages six employees within the systems and programming group. "You need the day-to-day emphasis to really put quality into the corporate culture."

Such challenges are tough even in flush times, but convincing workers of corporate commitment to quality is especially tough for managers amid recession and downsizing, experts say. Yet it's possible.

At Corning, employees give peers performance evaluations, merit raises and, on occasion, promotions or pink slips. While head count has dropped as several layers of management have been eliminated, Venette says, no jobs have been lost. Employees have been retrained and placed elsewhere in the company.

"If you are telling people it's up to them to come up with ways to streamline the organization and make it more effective, you have to guarantee up-front that they won't be unemployed as a result," Venette says.

Indeed, Texas Instruments, Inc. even created a new category of IS jobs as a result of its quality program. Dubbed "process re-engineers," these workers combine technical know-how with the ability to examine a business process for quality defects, explains Gary Pollard, total quality control manager for information systems and services at TI. These process re-engineers then devise ways to apply technology to fix problems. "We foresee that this will be a key job for IS workers of the future," he adds.

While such a scene may seem light-years away for many IS shops, pioneering IS groups at Carrier, Corning, TI and elsewhere show that it's possible. •

Some starting points for quality assistance

Following is a sampling of where firms can turn for information on quality in the workplace.

GROUPS AND ASSOCIATIONS:

American Executives for Manufacturing Excellence (AEME)
8655 East Via De Ventura/G-200
Scottsdale, Ariz. 85258
(602) 951-8994

American Productivity and Quality Center
123 North Post Oak Lane
Houston, Texas 77024-7797
(713) 681-4020

American Quality Foundation
Suite 2C
253 West 53rd St.
New York, N.Y. 10023
(212) 724-3170

American Society for Quality Control (ASQC)
P.O. Box 3005
Milwaukee, Wis. 53201-3066
(414) 272-8575

Association for Quality and Participation
Suite 501
801B West 8th St.
Cincinnati, Ohio 45203-1607
(513) 381-1959

Computer Power Group, Inc.
1500 Broadway
New York, N.Y. 10036
(212) 575-2225

Coopers & Lybrand
Division of Federal TQM Services
Suite 800
1525 Wilson Blvd.
Arlington, Va. 22209
(703) 875-2000

Council on Competitiveness
Suite 1050
900 17th St. NW
Washington, D.C. 20006
(202) 785-3990

Information Technology Association of America (formerly Adapso)
1616 N. Fort Myer Drive
Arlington, Va. 22209
(703) 522-5055

Juran Institute, Inc.
P.O. Box 811
11 River Road
Wilton, Conn. 06897-0811
(203) 834-1700

The Ken Orr Institute
Suite 3
5875 S.W. 29th St.
Topeka, Kan. 66614
(913) 273-0653

Quality Assurance Institute (QAI)
7575 Dr. Phillips Blvd.
Orlando, Fla. 32819
(407) 363-1111

Quality Breakthroughs
1407 S. 7th St.
Brainerd, Minn. 56401
(218) 829-0661

U.S. Dept. of Commerce's National Institute of Standards and Technology
Gaithersburg, Md. 20899
(301) 975-2000

U.S. General Accounting Office's General Government Division
Room 3858C
441 G St. NW
Washington, D.C. 20548
(202) 275-6059

Wolf Advisory International Ltd.
14 South Duke St.
Lancaster, Pa. 17602
(717) 299-6653

PUBLICATIONS:

"Combining Quality and Re-engineering for Operational Superiority"
"Indications" newsletter, September/October 1991
CSC Index, Inc.
(617) 499-1888

"Dr. Deming: The American Who Taught the Japanese About Quality"
By Rafael Aguayo
Simon & Schuster, Inc.'s Fireside Books, $11
(212) 698-7000

"QAI's National Quality Award Newsletter"
Suite 350
QAI
7575 Dr. Phillips Blvd.
Orlando, Fla. 32819
(407) 363-1111

Quality Magazine
Hitchcock Publishing
A Capital Cities/ABC, Inc. company
191 S. Gray Ave.
Carol Stream, Ill. 60188
(800) 633-4931

40th anniversary edition of ***"Total Quality Control"***
By Armand V. Feigenbaum
McGraw Hill, Inc., $62
(212) 337-5945

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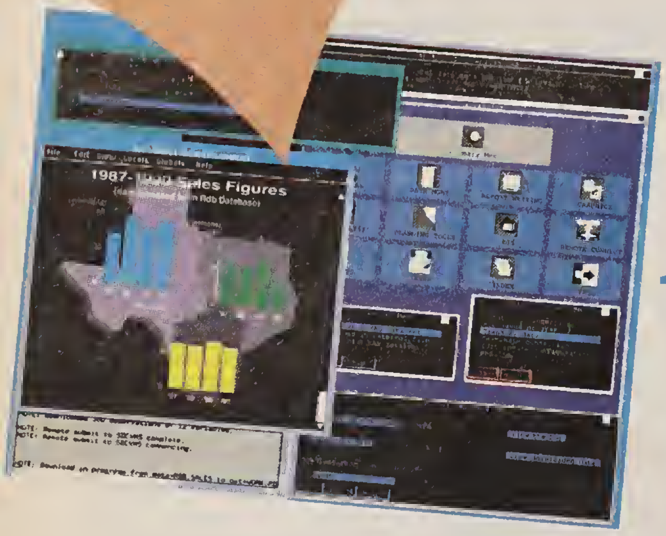

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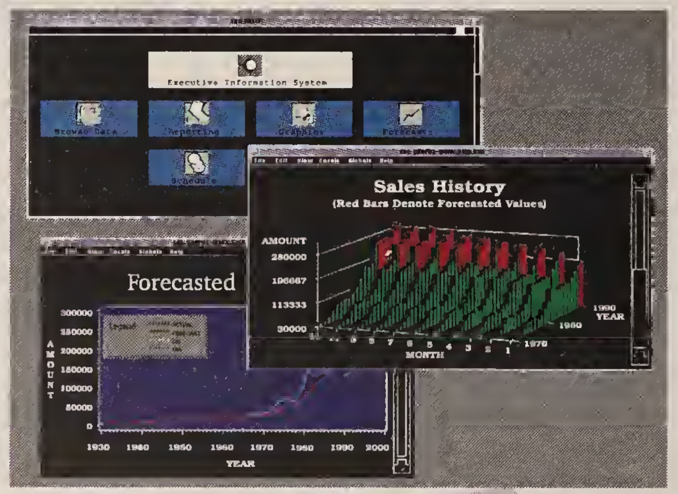
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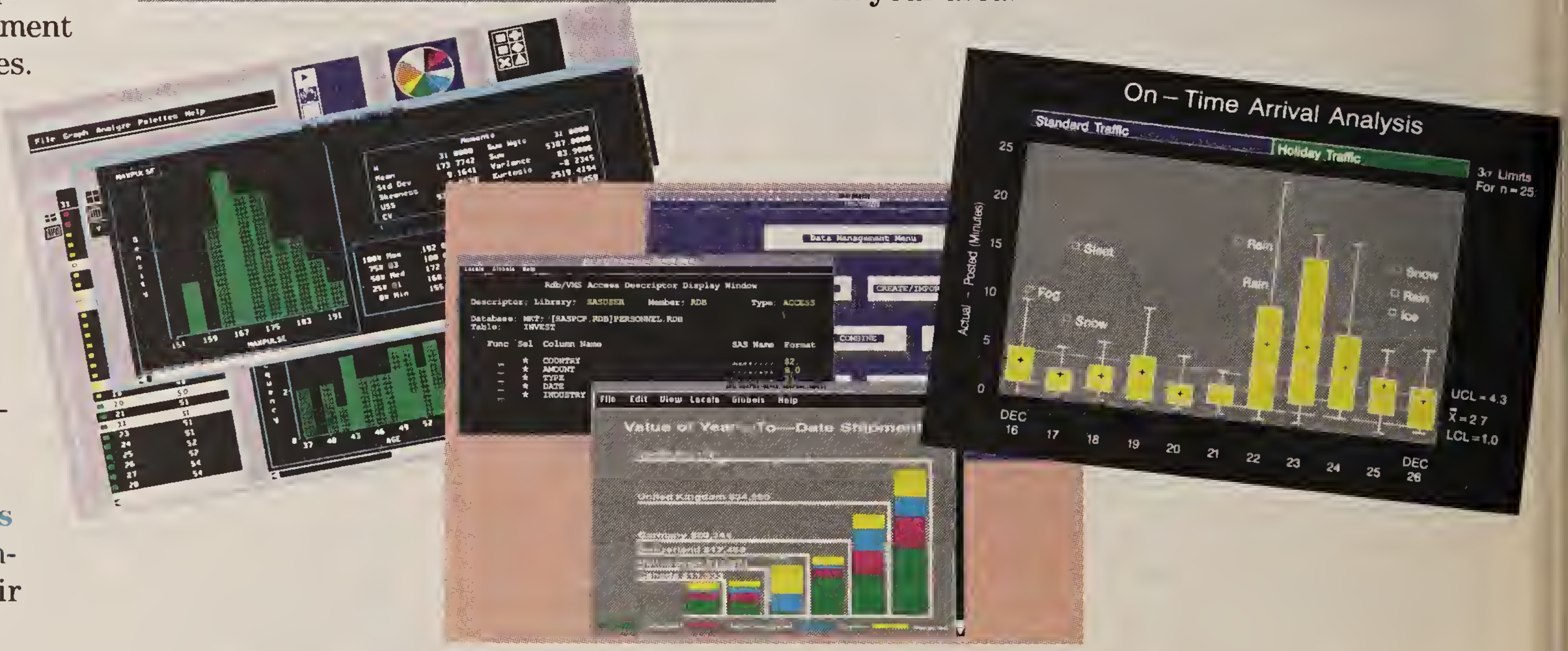

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Nashua keeps quality flame burning in customer service

BY CATHERINE MARENGHI

Long before it was in vogue to talk about quality, Nashua Corp. was trying to do something about it.

As far back as the late 1970s, the Nashua, N.H.-based manufacturer of office supplies and computer products worked with consultant and quality guru W. Edwards Deming. Company Chief Executive Officer William Conway had seized on quality as a means to grab long-term competitive advantage in manufacturing. Conway hired Deming, now a board member, to bring continual quality improvements to the company's processes and customer service.

- ►A five-year IS decentralization plan puts Nashua Corp. on a path to quality and flattens IS organization at the same time.
- ►IS makes system recommendations, but decisions are pushed down to organizations where changes will be made.
- ►Nashua expands from one to nine data centers, adds no personnel and reduces the number of IS middle managers.
- ►MIS director Tim Gallagher says IS improvements are not always consistent with quality improvements. Computerized systems can become difficult to change — and that goes against the grain of constant improvement.

For a long time, the company's information systems department had little to do with these efforts. Today, technology professionals are heavily involved in helping the $590 million corporation meet current quality goals.

The turning point came four years ago, when director of MIS Tim Gallagher launched a five-year strategic plan for IS decentralization. Gallagher, who oversees IS for each of the company's nine divisions, says he saw central concentration of the function as a barrier to change and quality improvement.

"It used to take us two days to process a telephone order," Gallagher says. "Now, [through decentralization] it takes us three minutes."

Formerly, Nashua's centralized information systems could process only data common to all divisions. Local systems augmented the centralized system, handling the unique requirements of each division.

The net result of this two-tiered approach was more likely to be customer frustration than satisfaction.

For example, if a customer called to order copy paper, the order taker had to dial into a central system to verify customer information and do a credit check. He then had to hang up and log on to a local personal computer to calculate pricing, which was unique to each division. If a second call to the customer with pricing information produced an order, the order taker had to check another central inventory availability system. If all went well and no errors were made, it took two days to complete the order — if the customer had not lost interest and gone to a competitor.

Today, clerks quote prices on available inventory, mentioning volume discounts or special orders when applicable, and process resulting orders on a local system in just minutes.

Five-year plan

Because each of the company's diverse businesses has its own set of manufacturing processes, raw materials, finished goods and customers, Gallagher says it did not make sense to have central systems that played to the lowest common denominator. Instead, he wanted each division to have the information systems that were best for its business.

The five-year plan was consistent with the company's overall philosophy of pushing decisions down in the organization to improve processes. At each plant, changes were effected by small teams of IS staffers and end users empowered to enact system changes at the local level. Corporate MIS provided the systems selection methodology, but it was up to the local team to make the hardware and software evaluations.

The result was discrete systems within each division, including four Digital Equipment Corp. Vaxclusters, an IBM RISC System/6000, a Wang Laboratories, Inc. VS 8360 and five IBM System/38s that are being converted to four Application System/400s this year. An IBM 4381 mainframe, the last vestige of centralized IS, will be phased out within 1½ years.

"It wasn't downsizing," Gallagher stresses.

At the same time, decentralization flattened the IS organization, shifting from a five- to a three-level hierarchy and growing from one data center to nine. The number of IS personnel has remained at about 60, but over time, there has been a redistribution of jobs: fewer middle managers and more programmer/analysts.

"Our annual net corporate expense for MIS has nearly doubled. But we have better systems in place at the functional level, handling the unique requirements of each division. We didn't get the best cost but the best fit," Gallagher says.

The added expenses have been mostly in outfitting the nine local data centers with the most appropriate systems, however — not purchasing high-ticket systems or glitzy applications. For example, a simple automated ZIP code verification package helps the company's Mail-in Photofinishing Division process 70,000 films a day with virtually zero errors.

Information systems are applied only where and to the extent that they make sense, says Earl Dodge, an internal quality consultant, noting that the company still does flowcharting by hand. "More attention is paid to a manufacturing process if a person physically plots a point on paper. It doesn't get lost in a lot of electrons floating through a computer," he explains.

Gallagher agrees that systems should assist, but not drive, the quality process. He even concedes that complex systems can occasionally subvert the process by imposing too much complexity. In fact, right now the company is wrestling with installing a new manufacturing resource planning II system but is concerned that the approach might actually make it more difficult for people to understand, change and improve processes.

Overall, Nashua doesn't expect miracles from its information systems and avoids buzzwords and catchphrases such as "quality circles" and "total quality management." You won't find a corporate quality program with a catchy name here, and the company has never applied for the coveted Malcolm Baldrige National Quality Award.

Webb Chappell

Nashua's Gallagher *says information systems should assist quality process*

But no matter what, the quality effort goes on — even when Nashua's stock price plunged from $37 to $20 this year because of a research and development failure at one of its facilities in Santa Clara, Calif.

"Quality isn't a contest you win just once. It has to be ongoing," Gallagher explains. ●

Marenghi is a Boston-based free-lance writer.

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(Can Sun do that? Nope.)

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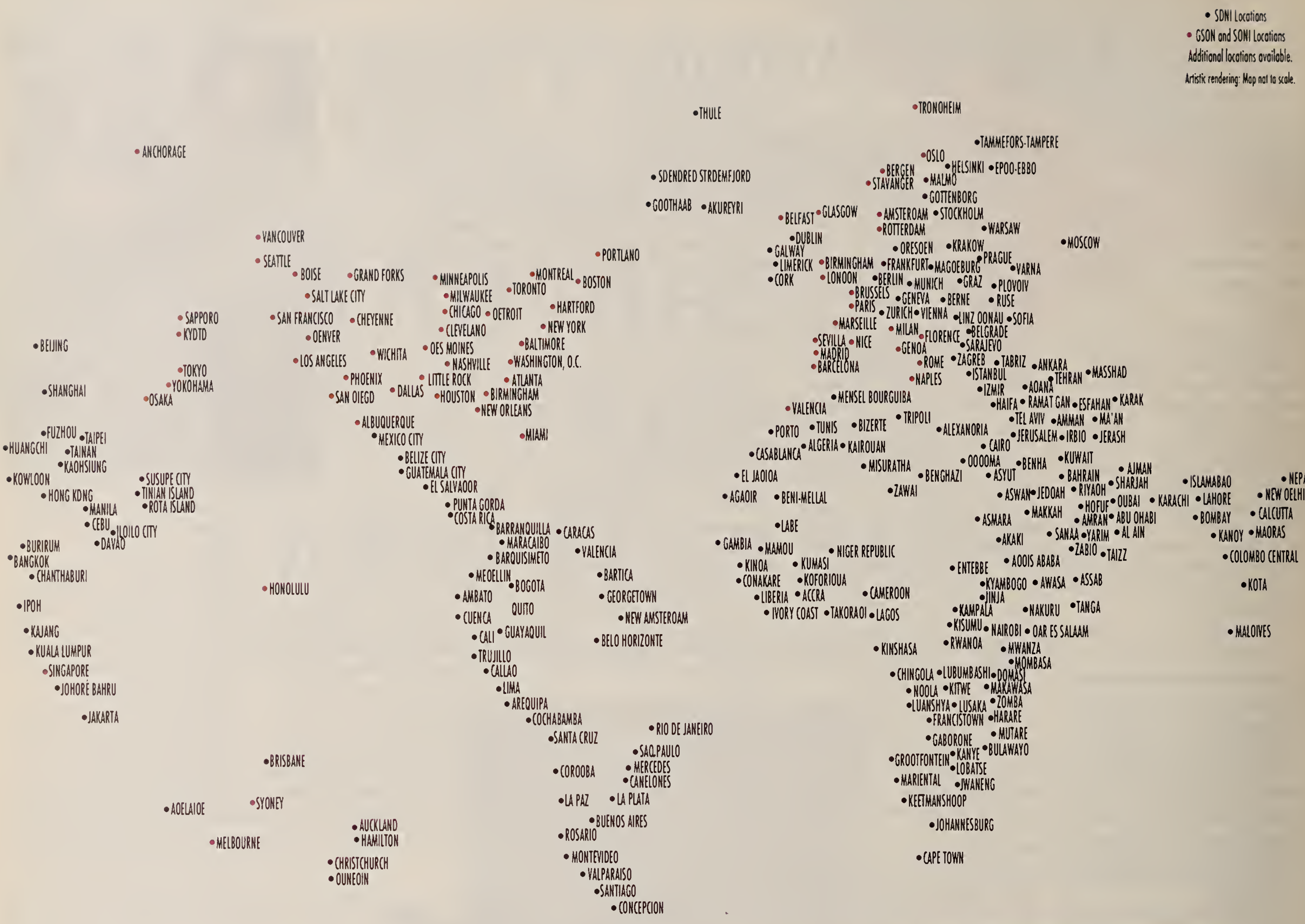

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Stanley hammers on quality

Tool maker focuses resources on applications to improve quality

BY CATHERINE MARENGHI

"We are in a permanent state of dissatisfaction." That's how James Gustafson, vice president of information systems at The Stanley Works, describes his company's philosophy on quality.

The $2 billion tool and hardware manufacturer based in New Britain, Conn., has no formal companywide quality program in place and no special staff devoted to quality management. Instead, Gustafson says, quality is part of every job.

For IS, that means focusing the department's annual $30 million operating budget and staff resources on key applications aimed at improving quality. A good example is the firm's recent investment in a warehouse management system. Designed to promote "perfect shipping," the system uses bar-code readers, weight-verification systems and a host of other technologies to improve accuracy and reduce manual errors.

Al Ferreira

Stanley Works' Gustafson: *Ensuring quality should be an inherent part of every job*

Stanley is also investing heavily in the manufacturing planning process to improve responsiveness to customer needs. On-line integrated MRP II systems help ensure that the right product is being manufactured in the right quantity at the right time. A salesforce automation system, designed to provide speedier and more accurate answers to customer questions about orders and shipments via handheld terminals, is in pilot testing.

A heavy user of electronic data interchange (EDI), Stanley takes 65% of its orders through direct links with customers. Cutting out paper orders has significantly reduced manual errors, Gustafson says. So successful is the program that the company plans to extend EDI partnering to freight carriers so that shipments can be tracked right to the customer's dock.

None of this comes inexpensively. Capital expenditures accounted for two-thirds of the $30 million IS budget last year. While equipment purchases have eliminated some jobs, Gustafson says, that's not how he measures return on investment. "Quality always pays for itself," he says.

The company keeps its informal quality effort alive through steering committees within business units. A corporate-level committee includes the chief executive officer — but not as leader.

While company quality efforts are voluntary for departments, a newsletter and a "status board" in the cafeteria report on what the teams are achieving, creating a healthy measure of competition.

Efforts like this are aimed at promoting a grass roots-level buy-in that, according to Gustafson, is necessary for quality programs to work.

"Quality was not a top-down directive," he says. •

Miles building quality from an IS foundation

Information systems are providing a solid footing for quality efforts under way at Miles, Inc., where IS has been asked to play a leadership role in bringing quality concepts to the $2.5 billion pharmaceuticals firm based in Elkhart, Ind.

This month, IS will face an even greater challenge, as four sister companies of Miles will be merged after 15 years of independence. Management wants the IS group to be the catalyst for a Total Quality Management (TQM) program for the new, combined $6.5 billion firm.

It's been a long road, says Vice President of IS and Logistics John Tremse, whose staff is split 60-40 between the firm's headquarters and operating divisions. He says developing strategic applications within business groups has not always been easy for IS. When efforts started in 1986, IS felt it was not making enough of a contribution or impact. A big problem, Tremse says, was an unclear understanding about what real value IS brought to business units.

ONE TYPICAL PROJECT that involved re-engineering the data center's on-line report generation system saved Miles $200,000 in out-of-pocket expenses.

Tremse says the staff needed to stop making technology an end in itself and, more importantly, needed to convince company business heads that IS focus had shifted away from strict technical concerns.

At the time, Miles had a "voluntary improvement program" in which employees could serve on improvement teams — a kind of quality circle — to talk about problems and concerns within IS. The idea was to get away from the practice of having workers complain in small groups about the environment or the limitations of technology, Tremse explains.

Tremse spent six months studying various quality gurus, such as Deming and Juran, before choosing a program by The Quality Improvement Co. in Cupertino, Calif. Soon after, executives were sent to training classes, then returned to train other IS employees.

The 26 quality improvement teams that were subsequently formed have completed more than 300 quality projects, Tremse says. IS team members identify problems, defects and barriers in such areas as applications development, requirements planning and data center management as well as work on fixes. Problems that cannot be solved by a single team are escalated to a cross-functional team spanning several departments.

One typical project that involved re-engineering the data center's on-line report generation system saved Miles $200,000 in out-of-pocket expenses, Tremse says.

The quality efforts at Miles are now spreading worldwide. A year ago, all transportation, central warehouse and import/export logistics operations came under Tremse's management, and he instituted a TQM program. To date, more than 300 employees have been trained in TQM concepts and functions. Tremse has been asked by other, non-IS managers to help train their departments in quality procedures.

"All of a sudden, the things we were doing in IS that were perceived as being rather strange by other employees have been legitimized," he says.

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Statistical software rings in quality

Emphasis on quality has loosed flood of software products to help firms improve their procedures

BY MEL MANDELL

Whether it involves squeezing precise quantities of spicy smoked beef into Slim-Jim casings or finding troublesome parts in Frigidaire, Inc. refrigerators, spotting and fixing quality problems is a hot topic.

The quality craze has created a healthy minimarket for specialized software designed to help companies improve products and processes. Dozens of vendors and packages are available, many focusing on statistical analysis.

For instance, "Quality Manager" from SPSS, Inc. in Chicago is a $6,000, DOS-based real-time process-control package that the company says provides historical trend data on products. It is used by electronics makers, as well as by food processors such as RJRNabisco, Inc., the company says.

Other leading sources of high-function statistical software include Bolt, Beranek and Newman, Inc. in Cambridge, Mass., and SAS Institute, Inc. in Cary, N.C. Low-end packages are sold by Scientific Programming Enterprises in Haslett, Mich., such as "Plot-It," which retails for $295.

Users of such products report favorably. At Goodmark Foods, Inc., the nation's leading producer of snack meats, statistical software helps eliminate waste and develop new products, says Tom Castater, manager of the quality control department at the company's Garner, N.C., plant.

Life made easier

Castater says the reason Goodmark chose Bolt, Beranek's RS/1 and RS/Explore over three other products was because of its ability to speed up and simplify statistical trend-spotting on the manufacturing line. The company runs the software on a Digital Equipment Corp. Microvax tied to a DEC terminal server and connected to VT 330 and 340 terminals. RS/1 was installed more than 13 months ago; RS/Explore was added six months later.

Before the software was installed, laboratory technicians hand-plotted between 100 and 150 key parameters on meat quality, fat content, moisture content and protein content on raw materials each day. The automated program now generates up to 1,300 charts a day.

Having good data immediately available makes a big difference in quality, Castater says. For example, workers used to control the weight of Slim-Jim fillings by using a scale, which wasn't always accurate or uniform.

Today, weight-deviation charts are posted daily at the line where Slim-Jim snack-meat casings are filled, a system that helps keep machine-filling on target, Castater says. Workers can now see when and by how much they stray from the specified weight. Besides random weighings, systematic weighings by supervisors are entered and plotted on the software. Problems pinpointed by RS/Explore are brought to the attention of plant managers at weekly meetings.

Cool savings at Frigidaire

Software packages used to raise quality and productivity while lowering scrap have also become popular. Vendors say these "design-of-experiment" packages, which reportedly help manufacturers optimize complex processes, apply to any product, from discrete components to a gas, liquid or solid.

One example is Bolt, Beranek's Catalyst, an Apple Computer, Inc. Macintosh-based system that sells for $2,495. Plant engineers and other users enter various parameters, then adjust each to graphically simulate the impact of other statistical parameters.

Ed Stiff, group quality director at Frigidaire, uses SAS/QC from SAS Institute to pinpoint quality problems for the firm's line of durable goods. A unit of Sweden's AB Electrolux, Frigidaire grosses about $6 billion a year, making it the nation's third-largest producer of home appliances.

The firm hopes to raise margins even more by cutting down on home-warranty repairs.

Under the old system, generating statistics was a big chore. Warranty claim records for Frigidaire's appliances were stored in five different databases maintained on a leased Burroughs Corp. mainframe. Products from the now-consolidated Frigidaire, Gibson, Kelvinator, Tappan and White-Westinghouse product lines are now assembled with many common parts in the same plant in Dublin, Ohio. Stiff says consolidation of each line's quality statistics into one comprehensive database was a key step.

The replacement system, which runs on IBM Intel Corp. 80386-based personal computers connected to an IBM 3090E mainframe, costs $300,000.

However, Stiff says the many payoffs have already outweighed the drawbacks. The new approach has already saved the firm about $500,000, mostly by eliminating the $50,000 cost for staffing the scrapped Burroughs system. The cutover also halved the number of data-entry clerks from four to two, he says.

Even greater savings have come in service calls, but Stiff declined to elaborate. Finally, the firm says, customers are more satisfied.

With global competition increasing, Stiff says, the firm is hoping information technology will result in better quality to enable worldwide expansion, cut costs and boost profitability. ●

Mandell is a free-lance writer based in New York.

Quality visits Washington

BY KRIS HERBST

The infant movement to use technology in improving quality has even spread to the U.S. government.

Officials say Information Resources Management (IRM) offices are just starting to help other organizations in the federal government implement Total Quality Management (TQM).

They are taking a "cautious, wait-and-see approach to implementing TQM," says Theresa Carroll. She's chair of the new Federal Interagency Council on TQM in IRM, an agency formed under the auspices of the Federal Information Resources Management Policy Council to create a foundation for government-wide quality improvement.

Given the government's heavy emphasis on customer service, it's surprising that information technology has not been seen as a crucial component in quality in federal programs before now, says Ian Littman, director of federal TQM services at management consultant firm Coopers & Lybrand.

Littman says passive IRM departments are frequently opting to let noncomputer operations begin TQM efforts. For example, in U.S. Department of Defense industrial activities, quality is pushed by workers who repair ships and planes.

Still, some federal IS departments are taking a more aggressive approach to TQM. NASA, for example, is looking hard at data-oriented activities across projects and programs and how they "tie together," says Wally Keene, NASA's IRM administrator.

It's IRM's task to work with scattered groups to identify and discuss common needs, Keene explains.

The approach is paying off: The agency's IRM office recently helped NASA's space centers save 60% — or several million dollars — on mainframe purchase prices by pooling procurements for four space centers.

Big savings — $19 million and 47 man-months — were also realized by combining supercomputer procurements from the Lewis Research Center in Cleveland and the Goddard Space Flight Center in Beltsville, Md., Keene adds.

Herbst is a free-lance writer based in Washington, D.C.

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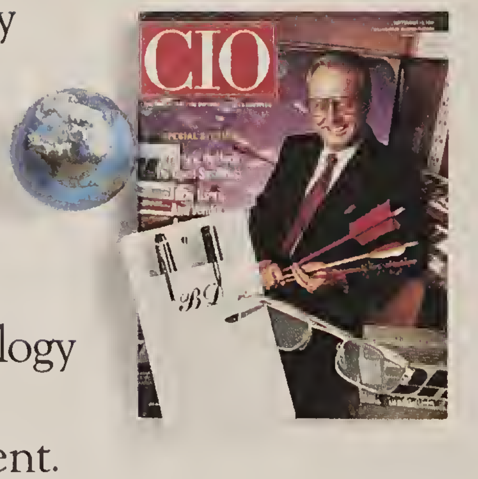
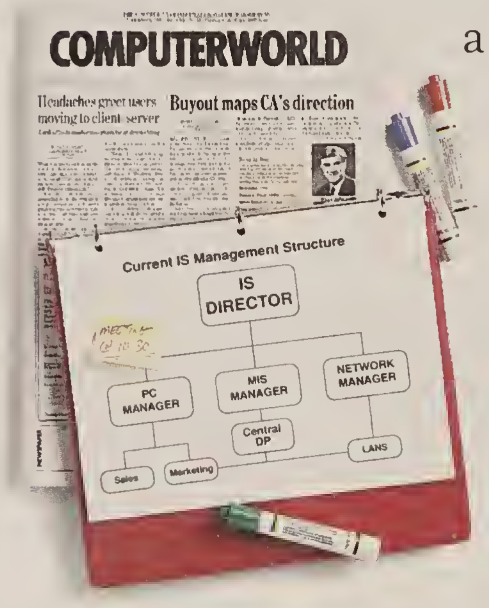


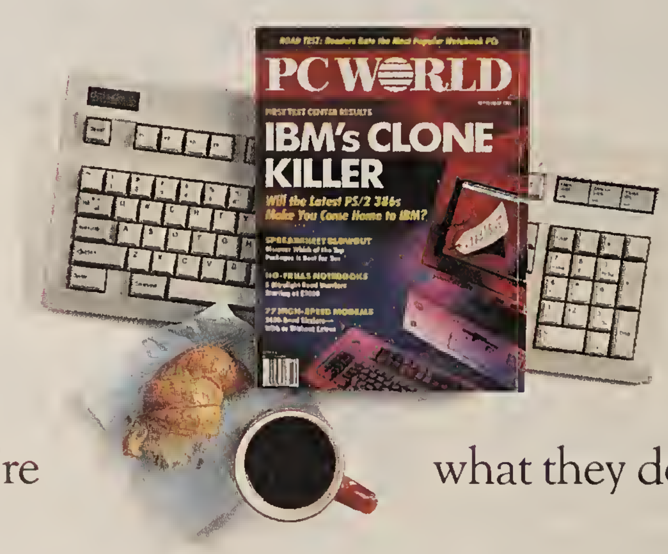
These days, technology has to serve everybody. The trouble is, everyone wants technology to do something different.



IS managers, for instance, are apt to put a very strategic spin on things. That's because they're charged with delivering information throughout the enterprise, integrating the company's computing and communications resources.

CIO's tend to look at the whole enterprise another way. After all, they're tackling some of the very trickiest issues in business. Like how to best use technology to produce the greatest business management gains.

Department managers, on the other hand, have to focus on doing just what their name implies. So they're more concerned with the productivity issues in their own backyard, their local area networks, and generally making sure their department is happy and humming along.



End users, however, have a different perspective entirely. They see the world from their desktop. They want whatever helps them do what they do better—while giving them access to the rest of the workgroup or a mainframe.

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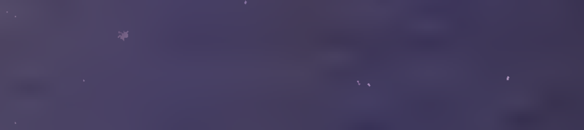

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To see how the 040 stacks up in real-life applications, just turn the page.

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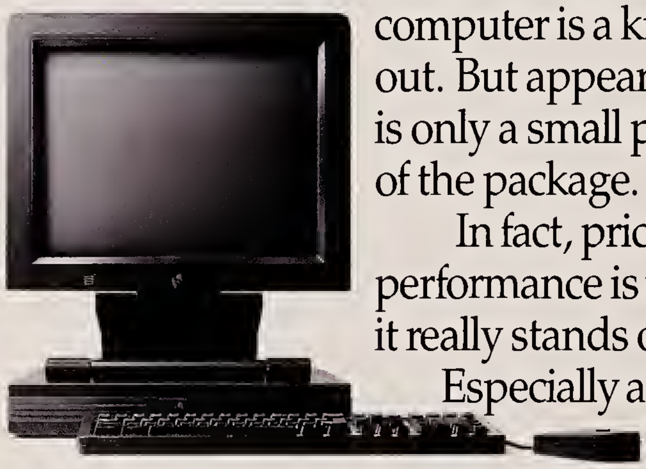

No doubt about it, the NeXTstation™ computer is a knockout. But appearance is only a small part of the package.

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Especially against the 486 based PCs (see chart).

This should come as no surprise when you consider the 68040 microprocessor inside the NeXTstation. Its independently operating caching system provides better sustained performance levels than the *i*486.™ And its powerful multi-bit manipulation instructions allow for easy GUI design. Not to mention

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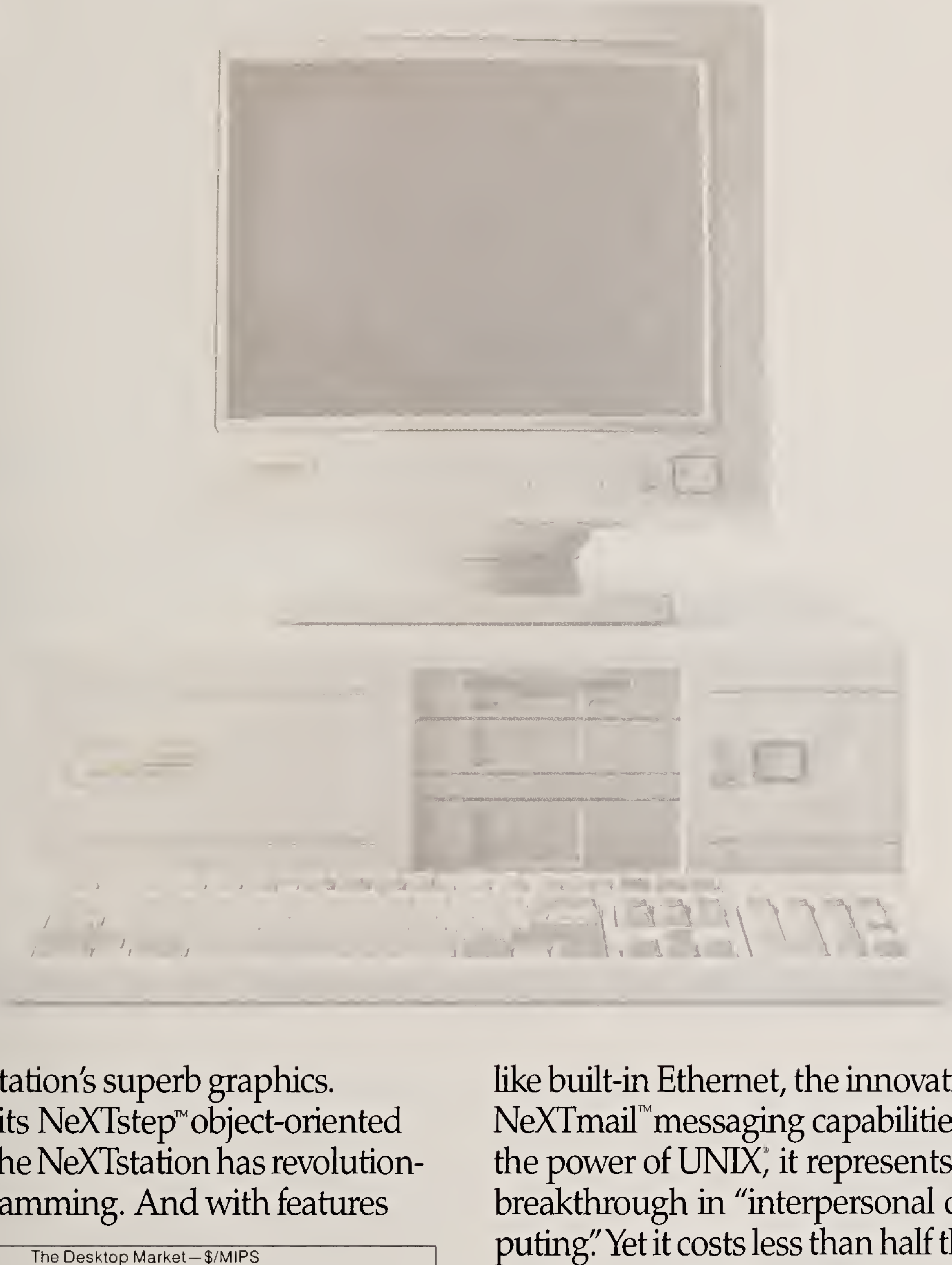

the NeXTstation's superb graphics.

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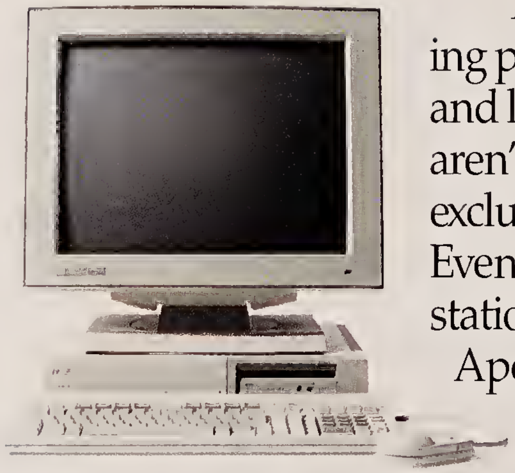
The Desktop Market—$/MIPS
040 vs. 486

Microprocessor	System	Perf/MIPS	System Price	Price/Perf.
Motorola 040	NeXTstation	15	$4,995	$333
Intel 486	Compaq Deskpro	14.7	$12,999	$884

The NeXTstation tested has a 17" MegaPixel Display™ with 8 MB memory and a 105 MB fixed disk; source is NeXT Computer, Inc. The DeskPro has a 12" Color VGA Display with 8 MB memory and a 330 MB fixed disk; source is Workstation Labs. Prices quoted are manufacturers' list prices and are subject to change.

heir respective companies.

Against Hewlett-Packard,



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Quite simply, the 425e can run more simultaneous applications, more efficiently than the Sun® SPARCstation™ ELC. Just check out the Windowing X11 performance. The 425e clearly outperforms the SPARCstation (see chart). And at a price/performance point that blows it away.

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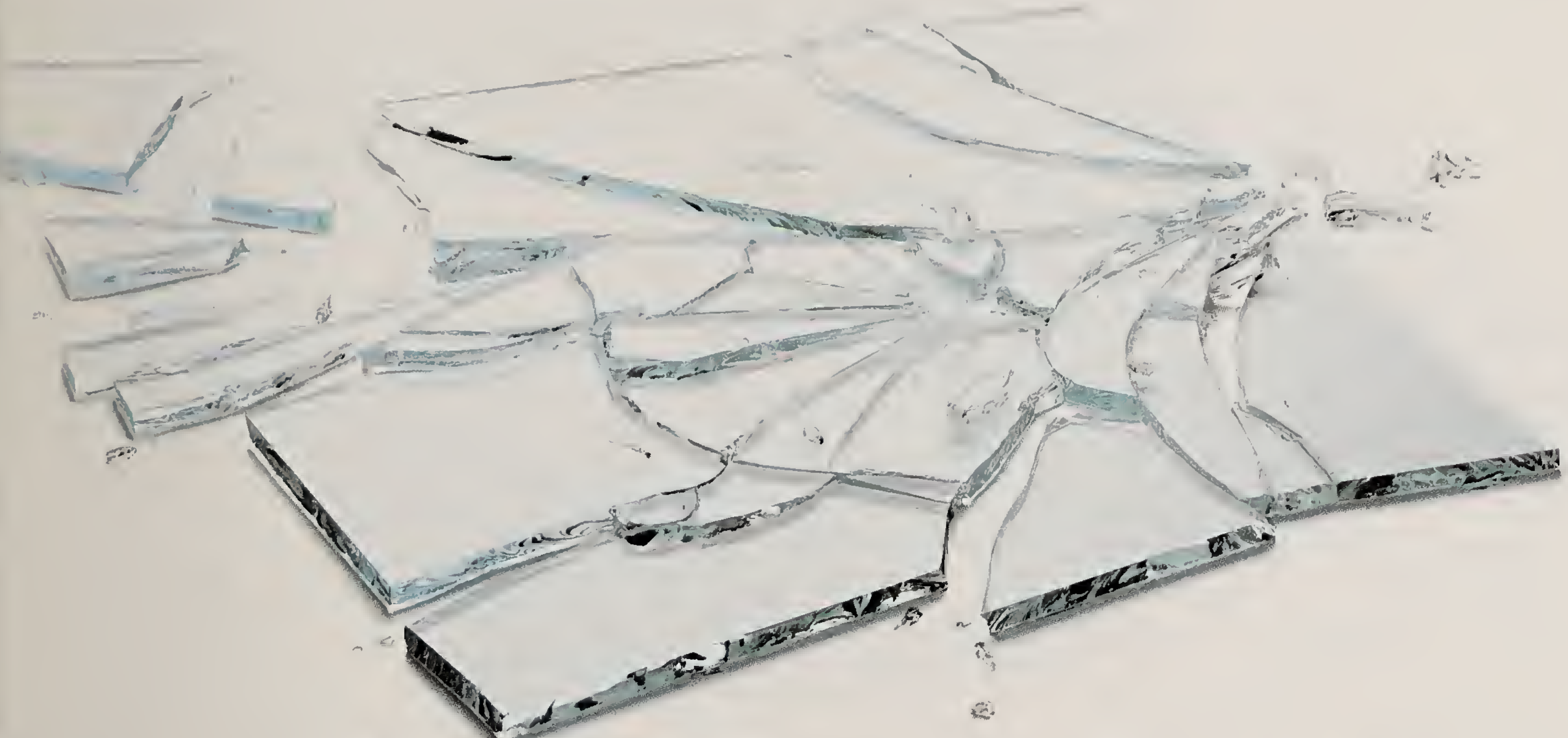


Sparc's windows shatter.

Then again, the 425e is a 68040-based machine. And the 040 incorporates RISC-like features such as integer and floating point pipelines, single-cycle execution, and load and store optimizations.

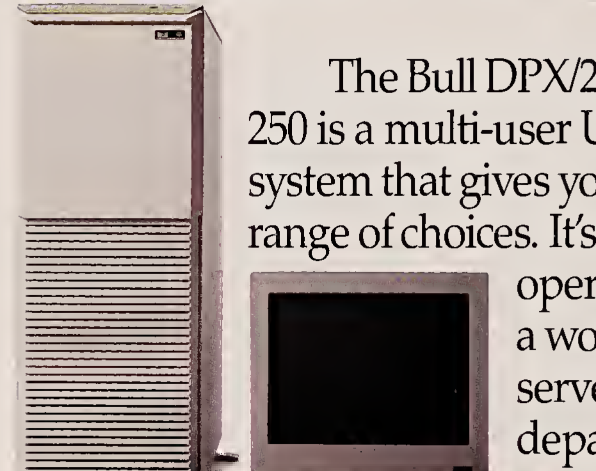
The Workstation Market—$/Windowing X11 Performance
040 vs. SPARC

Microprocessor	System	Windowing X11 Perf (ops/sec)*	System Price	Price/Perf.
Motorola 040	HP Apollo 425e	11,000	$5,490	$0.50
SPARC	SPARCstation ELC	6,500	$4,995	$0.77

So now people who need high-performance windowing, local processing power, fast data analysis, crisp graphics and versatile networking capabilities can have it all with an HP Apollo workstation. Without having to pay the price.

**Based upon X11 performance terminal emulation and 10x10 window management (publicly available benchmark). HP Apollo 425e configuration is 25 MHz, 8 MB RAM, diskless, 19" grayscale monitor SPARCstation ELC configuration is 33 MHz, 8 MB RAM, diskless, 17" monochrome monitor. Prices quoted are manufacturers' list prices and are subject to change.*

Head to head, Bull decks



The Bull DPX/2 Model 250 is a multi-user UNIX® system that gives you a wide range of choices. It's versatile, operating as a workgroup server, a departmental processor or an all-purpose system for small and medium sized companies.

It's powerful, thanks to a Motorola 68040 microprocessor at its core. With a burst interface on its bus controller, the 040 rapidly shuttles massive amounts of data on and off the chip. That translates to sustained peak performance in a demanding multi-user,

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the competition.

multi-functional environment.

So when it's put through its paces against MIPS RISC-based machines like the DECsystem 5100, the Bull DPX/2 is awesome. Weighing in with 19.5 AIMS versus the DECsystem's 17.5. And costing nearly $900 less per AIM (see chart).

The Commercial Market—$/AIM 040 vs. MIPS				
Microprocessor	System	AIM	System Price	Price/Perf. ($ per AIM)
Motorola 040	Bull DPX/2 Model 250	19.5	$26,290	$1,348
MIPS R3000	DECsystem 5100	17.5	$39,940	$2,282

The Bull DPX/2 250 was configured with 25 MHz CPU and 20 MB RAM. The DECsystem 5100 was configured with 20 MHz CPU and 64 MB RAM. As published in the AIM® Performance Report II. Prices quoted are manufacturers' list prices and are subject to change.

With that level of price/performance, it's no wonder Bull's Motorola-based server family has already sold over 25,000 multi-user systems. And more and more computer professionals are sold on Bull computers every day.

And as for Macintosh, ther

When the first Apple® Macintosh® appeared on the scene, it radically changed the face of the personal computer marketplace. And now Apple is redefining the high end of the PC market with the Macintosh Quadra™ 700 and 900 computers.

Supporting up to 20 megabytes of RAM, the Macintosh Quadra 700 may be the most powerful personal computer ever to sit atop a desk. And with support for up to 64 megabytes of RAM, the Macintosh Quadra 900 is the most expandable Macintosh yet.

**An Ingram Laboratories study published in October 1991 supports the conclusion that the Macintosh Quadra 900 performed 63% faster than the Dell 433P, 55% faster than the Compaq Deskpro 486/33L, and 20% faster than the ALR 486/50 when measuring the time taken to run sever*
product names are trademarks or registered trademarks of their respective companies.

e's simply no comparison.

Both come with built-in networking support. And both support all Apple displays and up to 32-bits of color.

But speed is their real distinguishing feature. The graphics architecture is faster than ever. They have enhanced SCSI and NuBus™ capabilities. And each contains a Motorola 68040. As a result, they run most applications almost twice as fast as the powerful Macintosh IIfx. In fact, in a recent independent study, the Macintosh Quadra 900 outperformed 33 MHz and 50 MHz 486-based systems by as much as 63%.*

The speed, graphics and flexibility of the Macintosh Quadra computers set them apart from any other personal computer. In other words, Macintosh is, once again, in a class by itself.

cintosh and Windows 3.0 applications (such as Excel and PowerPoint). Apple and Macintosh are registered trademarks of Apple Computer, Inc. Macintosh Quadra is a trademark of Apple Computer, Inc. NuBus is a trademark of Texas Instruments. All other brand and

So when you're looking for real power in a computer, consider the source.

No matter which criteria you use. Whether you're evaluating by MIPS, X11 Performance, AIMS, or simply the time it takes to run an application. The systems that come out ahead in price/performance are powered by the 68040. The microprocessor that has pushed on-chip integration to a new level.

Add to that Motorola's reputation for technical support at every level. Hundreds of Field Application Engineers and Systems Engineers worldwide have a detailed understanding of the 68040. They stand ready to aid in the most intricate system design, or answer the most basic questions.

Finally, consider the fact that Motorola was a winner of the first Malcolm Baldrige National Award for quality.

All in all, you know what you're getting when you go with an 040-based system. And all we can say is, more power to you.

For additional information on the Motorola 68040, call 1-800-845-MOTO.

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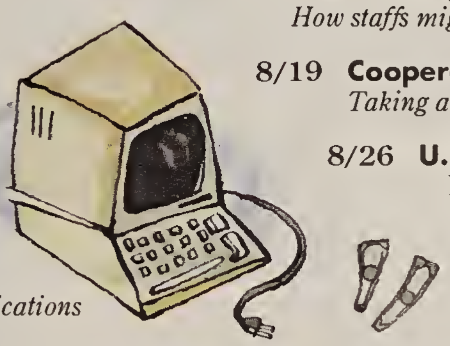

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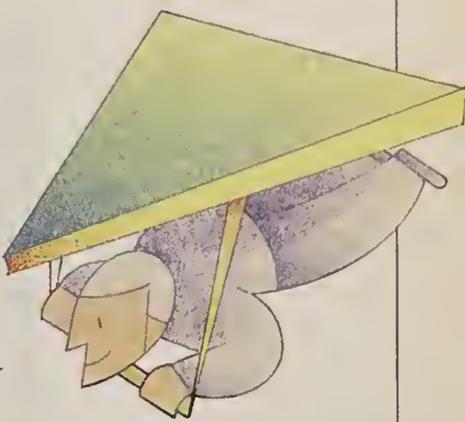

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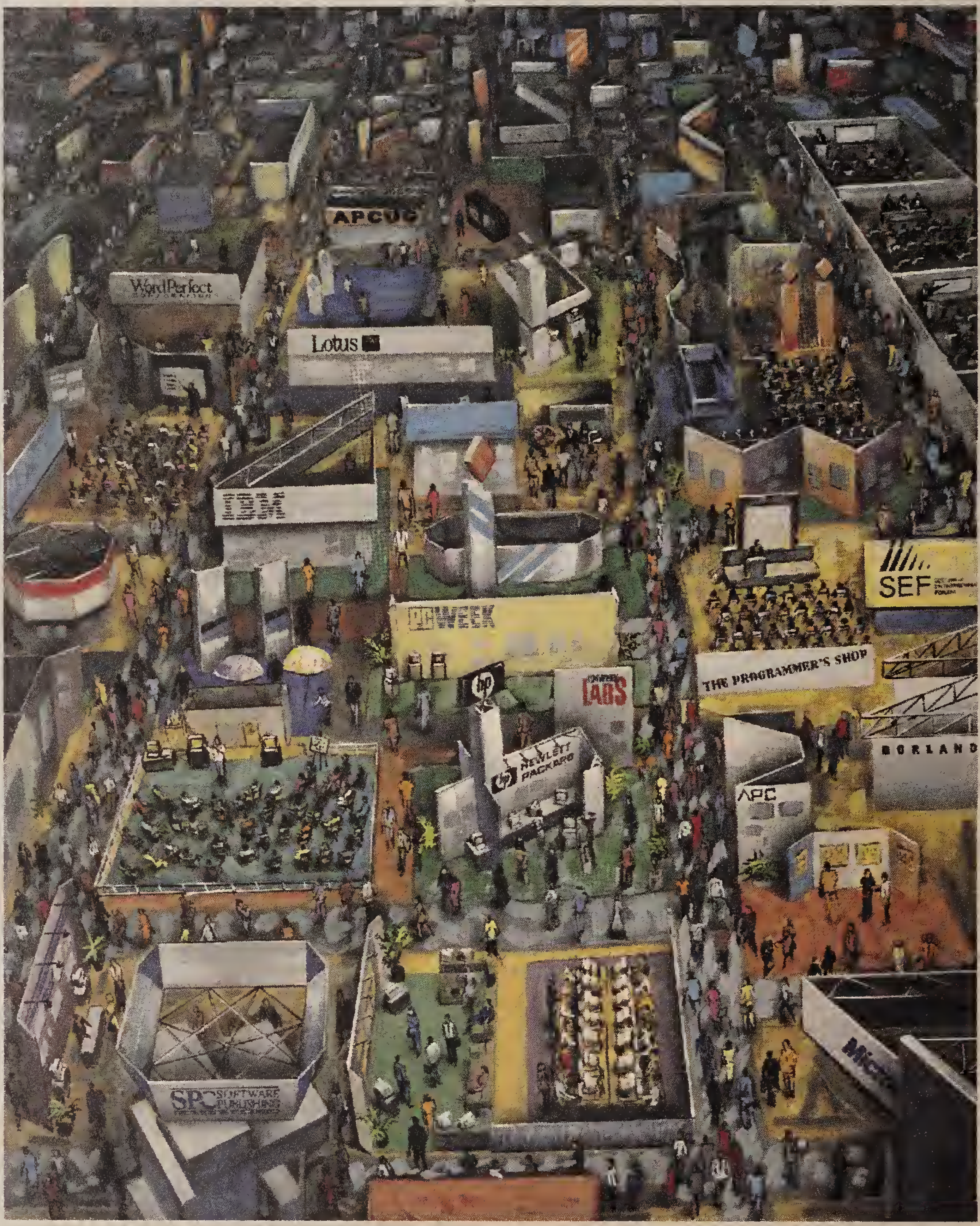

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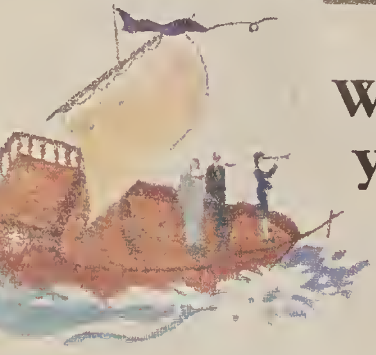

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NATIONAL BRIEFS

FIT to be tied

▶ Orlando, Fla.-based **Newtrend**, a company that targets outsourcing services at financial institutions, announced late last month an agreement in principal on a multiyear, $40 million contract with **Financial Information Trust** (FIT). If it closes, the FIT deal will be Newtrend's eighth multimillion-dollar outsourcing agreement in the past twelve months.

On the wings of a Dove

▶ The chairman of Austin, Texas-based **Microelectronic and Computer Technology Corp.** (MCC) has been appointed as a special partner in a strategic planning and investment banking firm targeting technology companies. **Grant Dove** will continue as head of MCC after he assumes his duties at Menlo Park, Calif.- based Technology Strategies & Alliances.

Vendor spender bender

▶ Local-area network equipment maker **Ungermann-Bass, Inc.** last month acquired a 50% equity interest in **Network, Inc.**, a Dallas-based LAN vendor.The two companies will continue to operate independently, according to UB. Meanwhile, **Genicom Corp.**, a Huntsville, Ala.-based maker of printers for large systems, will enter the nonimpact printer market by acquiring **Rastek Corp.**

Continued on page 72

Citrix hopes to grow in IBM's shadow

Former OS/2 head tailors firm's multiuser version of the operating system to suit customer needs

BY ROSEMARY HAMILTON
CW STAFF

CORAL SPRINGS, Fla. — While many industry analysts have been busy predicting the downfall of IBM's OS/2 during the last several months, Edward Iacobucci has been building a company on it.

Potential prosperity

Citrix Systems, Inc. hasn't closed the door on Windows — but it is staking its growth on IBM's OS/2

- A solid product offering: a multiuser version of OS/2.
- An impressive pedigree: Chairman Edward Iacobucci formerly headed IBM's OS/2 design team; venture backer Sevin, Rosen, Bayless Partners.
- A hedged approach: VAR market focus sets Citrix at one removed from desktop OS wars.

Source: Citrix Systems, Inc. CW Chart: Janell Genovese

Iacobucci, who headed the OS/2 design team at IBM, is now chairman of Citrix Systems, Inc., which began marketing a multiuser version of the operating system in February 1991.

Multiuser is aimed at customers who want both the ease of use of a desktop environment and also the support and management capabilities that traditionally come with host-based computing. As in the mainframe computing days of old, Multiuser allows a customer to support multiple users on terminals attached to a host system. In this case, however, the host is a low-cost microcomputer.

"The concept was to take OS/2 and extend it to a more traditional area with shared terminal support," Iacobucci said. "It's the best of both worlds. It has the features and benefits of a low-end Unix system without all the baggage. It has top-notch security and system management with the look and feel of DOS."

The concept seems sound and, for some initial users, Iacobucci's claims are holding true. "We've put some horrible stress tests on it, and it doesn't slow down," said Chris Crawford, president of Applied Micro Technology, Inc., a reseller in Austin, Texas. He said the company, which sells banking applications, recently added Multiuser to its roster of products. The firm also provides banking systems based on Novell, Inc.'s Netware.

However Citrix, which is based here, has not exactly exploded onto the market. According to Iacobucci's numbers, the company has signed on about 250 value-added resellers (VAR) and approximately 80 end users since the debut of its Multiuser operating system. The VAR market is its primary target, while end-user accounts will be picked up on an "opportunistic basis," Iacobucci said.

Uphill battle

Iacobucci considers this a good first year, but some industry observers said Citrix could have an uphill battle because many users do not want to consider yet another low-end operating system.

"I would have to be somewhat skeptical about someone coming out with an OS/2-branded product right now," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. "Users are not only skeptical about OS/2, but of new operating systems in general. Users may be somewhat afraid to go with an unknown at this point."

Nonetheless, the company has at least three factors working in its favor. First, it has a solid product offering, according to some users contacted recently.

"I think it's great," said Jim Hayes, information systems director at Taylor Medical, Inc., a

Continued on page 72

Close to the vest

Not surprisingly, Edward Iacobucci does not like to say too much about IBM or the various controversies that have swirled around OS/2. After all, his company, Citrix Systems, maintains a relationship with IBM, and most small firms know it is not wise to say too much about their bigger partners.

Iacobucci said he cannot discuss the specifics of the relationship, other than to say "we are in active discussions with them on a variety of products."

He also steered clear of the strained relations between former OS/2 collaborators IBM and Microsoft Corp.

"Our focus is on what the customer needs," he said. "We try not to get involved with the more emotional aspects of the discussions that are going on."

He would rather stay focused on the new firm, which he founded in 1989. Iacobucci, who had been vice president and chief technology officer, was named chairman late last year.

His additional responsibilities will require him to become an "evangelist on the product and the company," he said.

ROSEMARY HAMILTON

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Source: IDG Research Services, Fall 1991

INTERNATIONAL
BRIEFS

Supercomputer license

▶ Japanese giant **Fujitsu Ltd.** will license its Unix-based supercomputer operating system to German firm **Siemens AG**, according to a recent report in the European business press. Siemens sells almost all the Fujitsu supercomputers sold in Europe on an OEM basis, but under the new agreement, customers will be able to get both hardware and software from Siemens, the report said.

All on board

▶ Starting Jan. 1, 1993, firms will have the right to bid across **European Community** (EC) borders on telecommunications service contracts, following last month's adoption of an EC directive affecting all service tenders worth more than $260,000. The directive effectively fills in a major gap in Community Rules by subjecting to open tendering procedures all open tenders not already subject to existing EC rules on public works and public procurement contracts. Like its predecessors, the legislation will require the public authorities tendering service contracts to follow open and nondiscriminatory procedures such as publicizing a tender, observing time limits for tenders and publishing award winners.

On the go

▶ **Telefonaktiebolaget L.M. Ericsson** said it will sign an initial contract this year to develop and install a cellular mobile system in the **Tokyo** metropolitan area. The Sweden-based firm declined to disclose the value of the contract, which will be signed with the **Tokyo Digital Phone Co.**, a consortium that includes Japan Telecom, Pactel and East Japan Railway.

Exports curtailed

▶ When trade friction mounted several years ago over the export imbalance between the U.S. and Japan, the Japanese curtailed exports by setting up plants in the U.S. Now, with criticism focusing on Japanese corporate infiltration of the U.S. market, the pressure is on to export U.S.-made goods. **Mitsubishi Electric Corp.** and **Matsushita Electric Industrial Co.** both plan to ship overseas microchips made at their U.S. plants. Mitsubishi announced it would export about one-third of its 1-bit dynamic random-access memory chips produced at its Durham, N.C., factory to Japan, and possibly to Europe as well. Matsushita is said to have a similar plan.

Tech firms score big as entrepreneurs

BY NELL MARGOLIS
CW STAFF

It may have been a relative bummer in the big leagues, but the second half of the past decade was a banner period for technology firms in the entrepreneurial sector. This year's *Inc. 500* boasts 163 technology company entries — including the top-ranking company and two more in the Top 4.

The leader of the pack: 6-year-old Gateway 2000, a personal computer manufacturer based in N. Sioux City, S.D. In addition to copping top honors, firms offering products or services targeted exclusively at PC users accounted for approximately 10% of the *Inc.* spots. Milwaukee-based Computer Bay, placing at No. 309, franchises PC dealerships.

One reason for the PC prevalence, perhaps, emerged elsewhere in the research: 73% of the chief executive officers interviewed for this year's listing reportedly make daily use of a PC.

A whopping 40% of the technology firms that made this year's 500 were fueled by software-related products or services.

Published annually by *Inc.* magazine and widely viewed as the Fortune 500 analog for smaller companies, the *Inc. 500* measures revenue growth of small, privately held U.S.-based companies over a five-year period — in the case of the 1991 listing, the period extending from 1986 through 1990. For survey purposes, "small" is defined as between $100,000 and $25 million in revenue as of the end of the first measured year.

This year's strong technology presence on the *Inc. 500* comes at a time when the spotlight is trained on the entrepreneurial business model.

For one thing, industry observers have widely speculated that one result of the recent epidemic of computer industry layoffs will be a new wave of entrepreneurship.

In addition, IBM's recently announced reorganization into small, autonomous business units is intended to spawn entrepreneurialism, foster invention and cater to the customer's needs.

The relatively small size and, overwhelmingly, recent start-up status of the companies that make the *Inc. 500* allow for the kind of stunning five-year growth figures a giant cannot attain.

THE TOP 10 LIST

The highest-ranked tech firms on the 1991 Inc. 500 *list boasted the five-figure growth rates that are so often the exclusive preserve of the young, small and speedy*

Inc. magazine ranking		Sales growth, 1986 – 1990 (Percent of increase)
1	**Gateway 2000**, N. Sioux City, S.D. Manufactures and sells PCs	**26,469%**
2	**American Megatrends**, Norcross, Ga. Designs and manufactures computer motherboards	**23,850%**
4	**Technology Works**, Austin, Texas Designs and manufactures computer memory add-on products	**17,154%**
9	**Diamond Flower**, W. Sacramento, Calif. Manufactures and distributes PCs	**11,360%**
12	**Leasing Solutions**, San Jose, Calif. Leases computer equipment	**9,042%**
13	**Ehman**, Evanston, Wyo. Manufactures and distributes hard drives and monitors	**8,722%**
14	**WIN Laboratories**, Manassas, Va. Manufactures microcomputers	**8,630%**
18	**Shiva**, Cambridge, Mass. Manufactures and designs internetworking products	**7,959%**
22	**Thomas-Conrad**, Austin, Texas Manufactures LAN products	**6,869%**
23	**Starpak International**, Denver Services and fulfills software	**6,495%**

Source: *Inc.* magazine

Economy hits small firms

HINGHAM, Mass. — The toll of a tough economy often makes headlines when large companies are forced to make cuts, but smaller firms are facing harsh facts as well. One such firm, Software Developer's Co., has begun a major restructuring that has resulted in a more than 15% reduction in staff and the resignation of several executives.

The cuts reportedly will not affect programmers but are intended to consolidate support services such as shipping, receiving and accounting. In all, approximately 25 jobs will be eliminated, leaving 125 employees.

The restructuring-spurred charge against earnings could total as much as $3.5 million, triggering a loss of approximately that amount for the third quarter, according to the company.

The firm also announced that Chairman Bruce Lynch and Vice President of Distribution Stephen Underdown had resigned. Stephen L. Watson, president and chief executive officer, was elected chairman and will fill Underdown's responsibilities until a replacement is named, the firm said.

Software Developer's is the parent of Solution Systems, maker of Brief, a popular programmer's editor, and The Programmer's Shop, a software tools catalog reseller.

NATIONAL
BRIEFS

SIA report: Defects down

▶ According to a report recently released by the Semiconductor Industry Association, the industry has reduced the level of defects in integrated circuits used in military applications. The level of defects has fallen below the 100 parts per million (PPM) mark to approximately 40 PPM, according to the association's Quality Statistics Report on Military Integrated Circuits study. The association supplies more than 80% of the semiconductors purchased by the U.S. government for military, space and other applications.

Credit where credit is due

▶ The **U.S. Congress** has voted to extend for six months starting Jan. 1 a dozen tax credits, including the research and experimentation tax credit. The temporary research and experimentation credit has been extended annually since 1981, but late last month **Rep. Dan Rostenkowski** (D-Ill.), chairman of the House Ways and Means Committee, said last month that each of the 12 credits will be considered separately this year and will either be made permanent or scrapped for good.

Citrix hopes to grow in IBM's shadow

CONTINUED FROM PAGE 71

medical supplies company in Beaumont, Texas, where Multiuser has been installed for nearly a year. "I can take one box and support 40 users with good performance."

Second, Citrix has the backing of some big name venture capitalists, including Sevin, Rosen, Bayless Partners. The company has raised $6 million in two rounds of venture funding since its 1989 start and is currently raising its third round, Iacobucci said.

Third, while the firm's product is closely tied to OS/2, Citrix's overall strategy is not. Its focal market is the VAR community, which repackages software and sells systems for specific customer needs. As a result, the market is less sensitive to the desktop operating system race that has pitted Microsoft Corp. and IBM against each other.

In addition, Iacobucci said, Citrix is defining itself more as a multiuser system to compete against low-end Unix offerings than as an extension of OS/2.

"We don't portray ourselves as an OS/2 for LANs," he said. "We see ourselves as a more viable alternative to Unix."

Moreover, Iacobucci has not ruled out support of other technologies. The company is currently evaluating the possibility of supporting Microsoft's Windows New Technology in future versions of Multiuser.

Nonetheless, Iacobucci has plenty of faith in OS/2's future.

The selection of OS/2 as the foundation of the Multiuser product has obvious roots in Iacobucci's former job. He headed up the OS/2 design team at IBM and left the firm in 1989 because he wanted to run his own firm.

"It's the start-up experience," he explained. "I saw others doing it, and it was something I wanted to do."

Iacobucci insisted that his departure resulted from his personal ambitions rather than any disagreement with IBM's direction for the operating system.

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COMPUTER CAREERS

MBA improves prospects but not pay

BY ALICE LAPLANTE
SPECIAL TO CW

Although much lip service is paid to the idea that information systems employees need to know more about business, few organizations are currently backing up that talk by hiring MBAs for regular IS positions.

The MIS research center at the University of Minnesota recently completed a survey that asked 60 companies what kind of skills they sought when recruiting for IS positions. On a scale of 0 to 10 — where 0 represented strictly technical skills and 10 represented an MBA — the average score was 2.3.

However, there is evidence that this is changing.

"Fifty percent of the companies surveyed said they were moving away from their current hiring practices toward employing more MBAs within IS," says James Wetherbe, a professor at the University of Minnesota and director of the MIS research center there.

"With the changing role of IS people being more closely integrated into the business, it will be increasingly beneficial for any IS employee to have an MBA," says Joseph Wodushek, electronic data processing director at Waukesha Engine in Waukesha, Wis.

Moreover, as U.S. corporations put more emphasis on using technology to achieve competitive advantage, many IS workers are moving out of centralized departments and into business units to forge closer relationships with users. For such positions, an MBA can be a very valuable degree, IS managers say.

"In the past few years, I've seen companies hiring technical MBAs to act as liaisons between business and IS, with the idea that it's essential to have people who speak both languages," says Peter DiGiammarino, vice president of American Management Systems, Inc. in Arlington, Va.

"The integration of those two skill sets will be increasingly powerful," says DiGiammarino, who has an undergraduate degree in computer science and an MBA from MIT.

Higher cost a deterrent

This integration of skills is just starting to happen, however. Increasing emphasis on business notwithstanding, most IS managers say they aren't willing to provide higher compensation — especially in these tough economic times — just for those three magic letters, all other things being equal.

"If an MBA is going to do the same job as a non-MBA, the company obviously isn't going to want to pay extra for that person," says Joyce Hunt, president of Hamilton Technical Personnel, a recruiting firm based in West Hurley, N.Y.

IS managers and recruiters say an MBA is currently most useful to technical workers who wish to do the following:

- Advance from a technical to an IS management position.
- Go to work for an external systems consulting organization.
- Move into a non-IS business unit to act as a liaison between a corporate function and traditional IS.
- Make a complete career change into a corporate business position in finance, accounting or operations, albeit with technology skills as part of their management "tool kit."

For technical employees with management aspirations, an MBA makes a lot of sense.

Alan Mis, director of IS at American Steamship Co. in Buffalo, N.Y., worked his way up through the technical ranks at his department from a programmer position to manager of the department, picking up an MBA along the way.

"I thought it would enable me to do a better job as manager of a department," Mis says, adding that the MBA courses helped him in a number of ways, including analysis of financial issues.

Hunt says most of the requests for MBAs she gets come from the largest corporations — Fortune 50 or 100 firms — with huge centralized IS departments that want to groom MBAs for high IS management positions.

Another key IS opportunity for MBAs is an external consultant position. Universities say that their MBA graduates who specialize in IS tend to go to the large independent systems consulting houses such as Andersen Consulting.

"Only a small fraction are working for IS departments as such, yet a substantial proportion are doing IS-related work at consulting firms," says E. Burton Swanson, chairman of the IS area of the graduate business school at the University of California in Los Angeles.

Rick Nashleanas got his MBA from Indiana University and was recruited by IS consulting giant KMPG Peat Marwick in 1982.

"Many of these IS consulting firms have MBA-track positions where they exclusively hire people with graduate business degrees," says Nashleanas, who now runs his own software firm, Eden Systems Corp. in Carmel, Ind. One reason MBAs might be more suited for such work than for hands-on IS jobs is that although an IS concentration within an MBA program provides a strong basic understanding of IS management issues, few specific technical skills are taught.

"Many consulting firms with MBA-track positions expect you to pick up whatever technical specifics you need while on the job," Nashleanas says.

Precisely because MBA programs provide so little hands-on systems experience, most IS managers say they still prefer technical expertise.

Frank Nestor, director of data processing at Summit Consulting, Inc. in Lakeland, Fla., is the only person in the data processing department with an MBA. Although he would be "favorably impressed" by a potential employee who had one under his or her belt, he says experience is what really counts.

"The business background can be very helpful — especially these days, when data processing has to work so closely with other departments," Nestor says. Still, he says, he looks more at technical expertise than an MBA when hiring or promoting.

"All things being equal, an MBA is certainly a good qualification to have if you are being considered for a promotion," says Jim Carlson, manager of human resources at Kmart Corp. in Troy, Mich. "But performance at a given job still is the top criteria for advancement."

LaPlante is a free-lance writer based in Palo Alto, Calif.

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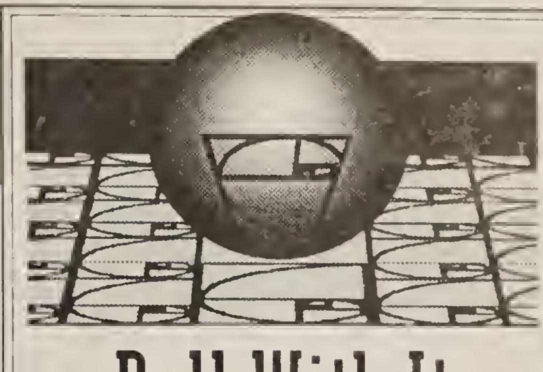

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INDUSTRY CURRENTS

Best market research prospects are in POS

BY JULIA KING
SPECIAL TO CW

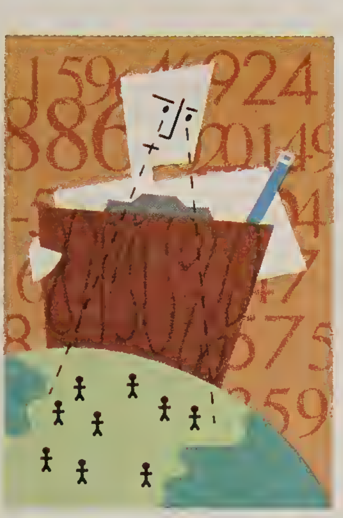
Trying to read the consumer's mind is a highly specialized business, according to information systems managers in the market research industry. As a result, IS job opportunities are largely limited to professionals with very specific skills, most notably programmers experienced with industry-standard applications programs such as Mentor by Computers For Marketing Corp., Quantum by Quantyme, Inc. and Quip by Trewhella, Cohen & Arbuckle, Inc.

For the most part, managers say IS staffs at market research companies tend to be small, offering few opportunities for mainframe and personal computer applications programmers, systems analysts and other categories of IS workers. However, market research giants Information Resources, Inc. (IRI) and A. C. Nielsen Corp. in Chicago, which do a lot of manipulating of point-of-sale (POS) data, are actively recruiting.

For example, at Louis Harris and Associates, an opinion research firm in New York, 10 of the 13 staff members in the company's IS department work on industry-specific applications, according to Sidney Johnson, vice president of systems.

"Systems programs tend not to change that much, so we don't really have a high need for applications programmers," Johnson adds.

Even further reducing IS opportunities, managers say, is an industrywide trend for market research companies to hire from within, recruiting in-house employees with a working knowledge of the market research industry for their IS operations.



"Market research is such a strange area that we tend to recruit people internally and train them in computers," Johnson says. "The reason is that our requirements are so different from what most programmers learn."

By way of example, Johnson notes that data at Louis Harris and most other research companies is compiled in a hierarchical fashion, rather than the linear fashion that most programmers are familiar with.

"Market research is very particular, and only a few applications programs are used. So it's very rare to find people who know these programs outside of the business," notes Pat Baker, data processing manager at J. D. Power & Associates, a consumer and automotive market research firm based in Agoura Hills, Calif.

Workers who use these specialized applications programs are primarily responsible for compiling appropriate sample groups of interviewees and scripting telephone interview questions.

"This work is both exacting and high-pressured," says Patty Karthauser, vice president and chief of computer services at The Gallup Organization in Princeton, N.J.

"Programmers typically work on seven to 10 different projects simultaneously, and if they make one mistake, it is propagated throughout every interview," Karthauser notes. As a result, she says, the job requires a person who is detail-oriented and who can work efficiently under the pressure of multiple deadlines. Currently, however, there are no openings for such people.

Of the seven market research firms interviewed, the Data Systems Division of IRI is the only company currently recruiting both applications programmers and senior-level analysts.

IRI prepares market research reports based on data it collects from POS and bar-code scanning systems in more than 3,000 retail outlets and 60,000 households across the nation. Each week, more than 40 million new records are added to the company's massive database, which is analyzed in hundreds of different ways and then sold to hundreds more client companies, including The Coca-Cola Co. and Proctor & Gamble Co.

Data Systems Division President Ned Heinbach describes the company's IS operation as "pretty much a pure vanilla IBM MVS shop." IS professionals currently being recruited include programmers with experience in PL 1, senior systems software programmers, CICS experts and specialists in MVS and RACF, he says.

Different strokes

Unlike companies such as Gallup and other custom market research firms, IRI and its chief competitor, A. C. Nielsen, package the same retail data in various ways for many different clients. This task falls primarily to applications programmers, whose ranks at IRI's Data Systems Division increased by 50% over the last year, according to Heinbach.

Because IRI's product is information and because it is continually expanding its product line, Heinbach says he expects employment opportunities in the IS area to continue to expand.

> "MARKET RESEARCH is such a strange area that we tend to recruit people internally and train them in computers."
>
> SIDNEY JOHNSON
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Agreeing with this is Mike Oak, vice president of information services at Nielsen Household Services, a market research division of A. C. Nielsen, based in Port Washington, N.Y.

Currently, Neilsen Household Services is in the process of developing budgets and is not actively recruiting, Oak says. But this year, he anticipates adding workers to the company's 30-member IS department. Skills the company will seek will most likely include Pascal and C programming and an understanding of data structures and relational databases.

King is a free-lance technology writer based in Ridley Park, Pa.

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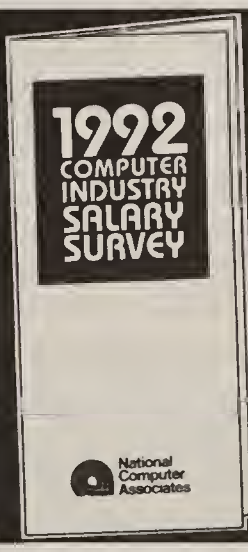

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BY ALAN RADDING
SPECIAL TO CW

Disaster recovery planning today means more than just keeping the data center operating. A new generation of contingency planning software expands the scope of disaster recovery to include total business recovery — such as keeping alive customer sales or service operations — and telecommunications network recovery, the voice and data links that are vital to a business' survival.

Contingency planning/disaster recovery software helps organizations collect and maintain the myriad of details about personnel, resources and tasks that are required to keep the organization functioning in the face of an emergency, be it a power outage, fire or flood. The software stores the information in the database and produces lists of who does what, when, where and how. The software also incorporates a formal methodology to guide users through the bewildering process of creating a disaster recovery plan.

Among the leading contingency planning software products are Total Recovery Planning System from Chi/Cor Information Management in Chicago; DP 90 Plus from Sungard Planning Solutions, Inc. in Wayne, Pa.; Recovery PAC from Computer Security Consultants, Inc. in Ridgefield, Conn.; Living Disaster Recovery Planning System (LDRPS) from Strohl Systems in Plymouth Meeting, Pa.; and Compas from Comdisco Disaster Recovery Services, Inc. in Rosemont, Ill.

List prices for the leading products range from less than $10,000 for a single-user license to more than $25,000 for multiuser licenses, but users report a lot of price negotiation, particularly when buying multiple copies or corporate licenses.

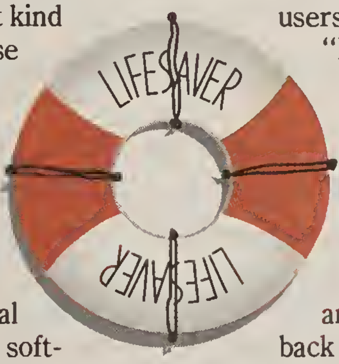
"The price is highly negotiable. Every vendor is willing to deal," says Louise Hritz, contingency planner at Dollar Federal Savings Bank in Pittsburgh. Hritz says he selected Recovery PAC from Computer Security, although Comdisco, Dollar's hot-site vendor, "offered us a great price."

Focus on features

With all vendors willing to bend on the pricing issue, users generally focus first on the product itself. The most important features include the database, ease of maintenance, ease of use, flexibility, methodology and reporting.

All the major products are currently built on a relational database of some sort. Gone are the days when organizations built and maintained a disaster recovery plan on a word processor-based system. Relational database technology makes data input and maintenance much easier. For example, users want to input data only once. When the inevitable changes occur, users want to make the change in one place and have it automatically reflected throughout the plan.

"You need a relational database, or maintenance becomes a nightmare," says Joseph Olivo, assistant vice president at the National Community Bank of New Jersey in Maywood, N.J., an LDRPS user. He adds that it doesn't matter what kind of relational database it is. Nor does it matter, contrary to some vendor claims, if it is a true relational database.



After being assured of the relational character of the software, managers next want ease of use — from pull-down menus and context-sensitive Help to plain-English prompts, commands and querying. For most users, disaster planning is an occasional responsibility. "Ease of use is very important. People have to get around inside the product without knowing about programming," says Sue Volpi, information systems disaster recovery coordinator at Total Petroleum, Inc.

Without a Help feature, users can easily get lost in a big disaster recovery program. "Compas requires that you understand how the product is laid out. They provide a chart to help you navigate, which I still keep taped to my desk," says John Dorman, a certified disaster recovery planner at a large California bank. He puts up with the difficulty in using it because its methodology — a team approach — closely matches his own.

"I like the pull-down menus of Recovery PAC. It guides you through the program very well," Hritz says.

Paul Beim, security engineer at New York-based Metropolitan Life Insurance Co., found LDRPS easy to use: "We like the Help screens. They are context-sensitive."

Ease of use is particularly important in data collection. If data gathering isn't intuitively easy, users won't cooperate. "LDRPS has a form shell that you can download to a disk and hand to users," Beim explains. Users run the disk, fill in answers to questions and send the disk back to incorporate the data into the plan — a no-brainer. Other systems offer a more cumbersome ASCII import/export process.

The complexity of disaster recovery planning requires that the software provide a methodology around which the organization can build its plan. All the products steer the user toward their particular methodologies.

Managers, however, need to match the particular methodology to the way the organization works. "We like the team concept of Compas and how it is based on recovery action teams," says Scott Culbertson, manager of security systems at Shared Services Center in Harrisburg, Pa., which provides data processing services for several Blue Cross/Blue Shield plans.

Hritz, however, had just the opposite reaction: "The problem with Comdisco is you have to follow their methodology."

Flexible method

Flexibility is important. Too rigid a methodology becomes a hindrance.

For instance, in an evaluation of five major packages, the U.S. Postal Service insisted that it be able to tailor the methodology, reports Steven Skolochenko, manager of automatic data processing security at the U.S Postal Service in Washington, D.C. The Postal Service selected DP90 Plus, which has a nine-step methodology, but Skolochenko said he liked three products equally. He left it to the purchasing department to make the final pick based on who offered the best terms.

Users also want to customize reports. The preformatted reports in all the leading products cover the basics, Skolochenko says, but users typically want more.

"I want to create [recovery] manuals the way we want them," Hritz says. A popular reporting feature offered by some vendors is the ability to generate an individual recovery plan for each department.

Other issues of interest to users are the availability of telephone support and provisions for testing the plan. Most vendors also offer optional training and consulting. Although they will do the plan (most likely at a high cost) for you, you will still have to maintain it.

Radding is a free-lance writer based in Newton, Mass.

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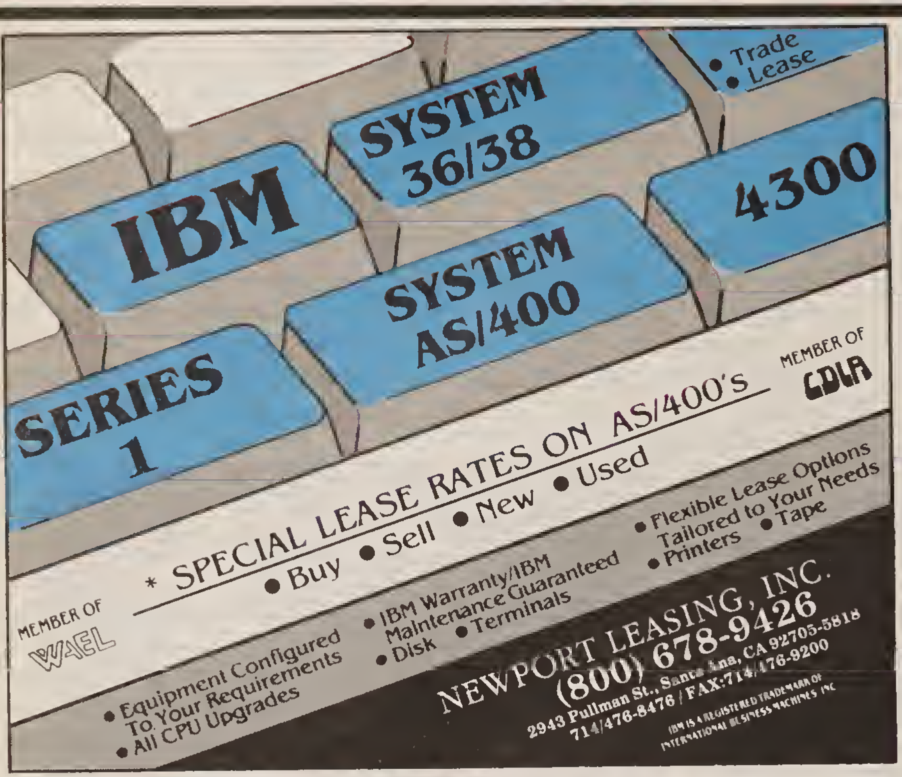
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PS/2 Model 60	$900	$1,500	$900
PS/2 Model 80	$2,250	$2,600	$2,150
PS/2 Model 90	$4,300	$4,600	$4,100
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LTE 286	$1,000	$1,300	$900
Deskpro 286E	$850	$1,000	$800
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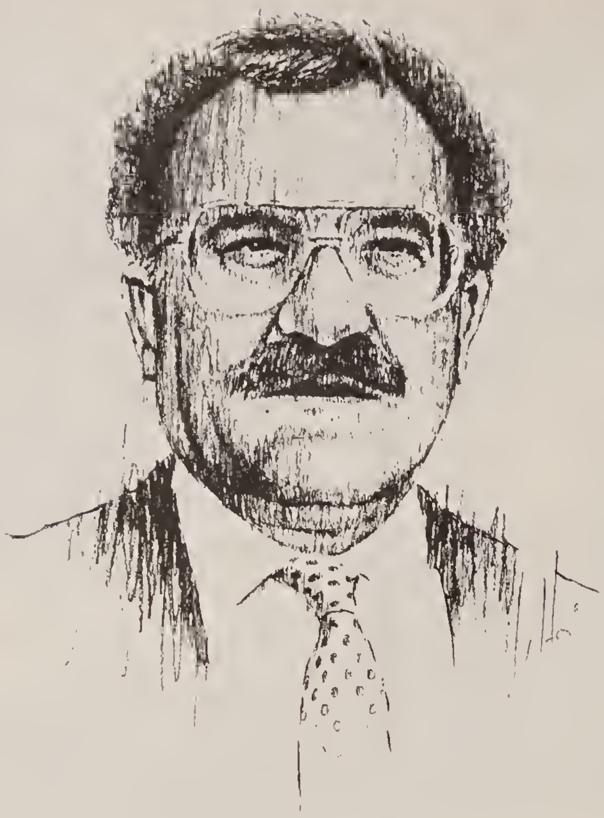

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INDUSTRY ALMANAC

NETWORKING STOCKS

Kenneth Leon, analyst at Bear, Stearns & Co., Dec. 18, 1991

On the telecommunications side, the network switching and transmission market looks very strong this year. **AT&T**, which has strong global Postal Telephone and Telegraph relationships, stands to gain ground.

AT&T recently lost a $1 billion contract at Ameritech, which chose **Northern Telecom, Inc.** and **Siemens AG** instead. The failed deal probably will not set AT&T back much, said Chairman Robert Allen. He is bullish on new market opportunities in wireless switching systems, personal communications networks and broadband video and high-speed technologies.

AT&T stock was recently upgraded from buy to strong buy.

Louis Giglio, Bear, Stearns, Dec. 18, 1991

International growth remains stronger than domestic growth for **Novell, Inc.** However, the company's U.S. business increased 20% in 1991. Sales in 1990 were up 9% over 1989, which grew 15% over the previous year.

Novell's workstation operating system strategy will unfold this year, resting on several factors, including the **Digital Research, Inc.** merger. Plus, Novell's substantial investment in **Unix International** and its partnering with leading Unix vendors, including **Sun Microsystems, Inc.**, will likely lead to Novell taking a more aggressive role in desktop Unix. Novell is rated buy, and Sun was recently upgraded from buy to strong buy.

Richard Billy and Sam Kim, analysts at Prudential Securities, Inc., Dec. 23, 1991

Synoptics Communications, Inc. just reported better quarterly financials than **Cabletron Systems, Inc.** for the first time. However, Cabletron officials said in a conference call that Synoptics' recent price cuts on networking gear have been a "competitive nonevent."

Cabletron sales continue to be very strong. The stock is rated buy.

KIM S. NASH

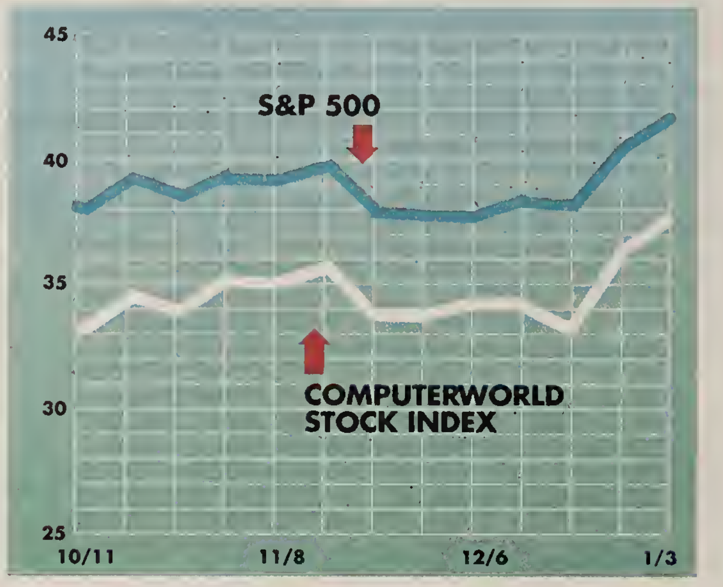
What to buy

Analysts are mixed on networking stocks

Company	Alex. Brown & Sons, Inc.	Montgomery Securities
Cabletron Systems, Inc.	Neutral	Outperform
Chipcom Corp.	Not rated	Outperform
Network Equipment Technologies, Inc.	Neutral	Outperform
Network Systems Corp.	Neutral	Aggressive buy
Novell, Inc.	Strong buy	Aggressive buy
Octel Communications Corp.	Strong buy	Outperform
Proteon, Inc.	Not rated	Outperform
Synoptics Communications, Inc.	Neutral	Not rated

CW Chart: Janell Genovese

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Investors kicked off 1992 by going gung ho on software stocks. Adobe Systems, Inc. rocketed 5 points last week to 67¾, and Borland International, Inc. shot up 6 points to close Thursday at 86.
- Knowledgeware, Inc. started the new year off with a 3½-point jump last week, closing at 15¾. Meanwhile, rival Intersolv, Inc. gained 1¼ points to 17¼. Texas Instruments, Inc. also gained, moving up 1 point to 32.
- Among heavy losers, Pyramid Technology Corp. sank 3 points to 12¾ after preannouncing an impending quarterly loss attributed to the continuing worldwide recession. Other clunkers included Picturetel Corp., which lost 2½ points to 45¾, and Stratus Computer, Inc., which stumbled 2 points to 48⅝.
- Hewlett-Packard Co., which is set to announce a new diskless workstation next week, rose 2⅛ points to 56. Mips Computer Systems, Inc. dropped ½ a point to 9⅝.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JANUARY 3, 1992

TOP PERCENT GAINERS

Cognos Inc.	30.00
Convex Computer	26.25
Knowledgeware Inc.	25.51
Weitek	23.26
Rexon Inc.	21.74

TOP PERCENT LOSERS

Televideo Systems	-17.02
Microcom Inc.	-16.48
Printronix Inc.	-14.29
Pyramid Technology	-14.29
Sungard Data Sys.	-7.55

TOP DOLLAR GAINERS

Matsushita Electronics	8.50
BMC Software Inc.	7.00
Storage Technology	6.25
Aldus Corp.	5.75
Autodesk Inc.	5.25

TOP DOLLAR LOSERS

Picturetel Corp.	-3.25
Pyramid Technology	-2.25
Computer Sciences	-1.88
Microcom Inc.	-1.88
Sungard Data Sys.	-1.50

Communications and Network Services — Up 4.21%

Exch	52-Week	Range		Jan. 3 Close	Wk Net Change	Wk Pct Change
OTC	12.63	5.50	3 COM Corp.	11.13	0.00	0.00
NYS	69.75	55.75	American Info Techs Corp.	64.50	1.50	2.38
NYS	40.38	29.00	AT&T	39.63	0.63	1.60
OTC	4.13	0.88	Artel Communication Corp.	2.25	0.25	12.50
NYS	54.13	43.00	Bell Atlantic Corp.	48.50	1.38	2.92
NYS	54.88	45.38	Bellsouth Corp.	52.50	2.13	4.22
NYS	53.25	25.50	Cabletron Systems	53.25	2.75	5.45
OTC	29.25	8.25	Compression Labs Inc.	26.50	4.38	19.77
OTC	5.13	1.50	Data Switch Corp.	1.88	-0.13	-6.25
NYS	21.50	11.63	Digital Comm. Assoc.	18.25	0.13	0.69
OTC	25.25	14.00	Dynatech Corp.	19.75	-0.75	-3.66
OTC	12.38	5.00	Fibronix Int'l Inc.	7.50	0.88	13.21
OTC	24.25	6.75	FileNet Corp.	24.25	2.50	11.49
OTC	3.75	1.13	Gandalf Technologies Inc.	2.13	0.25	13.33
NYS	3.88	2.00	General Datacomm Inds.	3.00	0.13	4.35
NYS	34.88	27.50	GTE Corp.	34.25	0.00	0.00
NYS	63.00	44.88	ITT Corp.	55.75	1.63	3.00
OTC	31.88	17.88	MCI Commmunications Corp.	31.38	2.63	9.13
OTC	14.50	3.25	Microcom Inc.	9.50	-1.88	-16.48
NYS	15.88	4.00	Network Equipment Tech.	15.25	0.25	1.67
OTC	16.50	6.25	Network General	16.50	1.13	7.32
OTC	18.88	10.50	Network Systems Corp.	17.38	2.13	13.93
NYS	46.25	26.25	Northern Telecom Ltd.	45.38	1.50	3.42
OTC	62.50	15.25	Novell Inc.	60.88	2.50	4.28
NYS	80.75	67.00	Nynex Corp.	80.75	1.88	2.38
NYS	46.75	38.50	Pacific Telesis Group	45.00	2.38	5.57
OTC	11.63	5.63	Penril Data Comm. Ntwks.	6.75	0.38	5.88
OTC	50.75	11.00	Picturetel Corp.	45.00	-3.25	-6.74
NYS	17.88	11.50	Scientific Atlanta Inc.	16.75	0.50	3.08
NYS	65.88	49.00	Southwestern Bell Corp.	65.50	2.13	3.35
NYS	31.50	21.25	United Telecom	23.75	0.63	2.70
NYS	40.75	33.75	U S West Inc.	38.75	2.25	6.16

Computer Systems — Up 4.04%

Exch	52-Week	Range		Jan. 3 Close	Wk Net Change	Wk Pct Change
OTC	20.75	8.25	Advanced Logic Research	9.75	0.25	2.63
ASE	17.88	11.63	Amdahl Corp.	15.88	0.50	3.25
OTC	73.25	40.25	Apple Computer Inc.	59.00	4.00	7.27
OTC	9.13	2.75	Archive Corp.	4.75	0.25	5.56
OTC	32.75	14.50	AST Research Inc.	18.00	1.50	9.09
NYS	9.38	4.63	Bolt, Beranek & Newman	5.00	-0.25	-4.76
NYS	21.63	8.75	Commodore Int'l	16.00	-0.75	-4.48
NYS	74.25	22.13	Compaq Computer Corp.	30.00	3.75	14.29
OTC	2.63	0.38	Computer Automation Inc.	1.13	0.06	5.83
NYS	13.75	6.75	Control Data Corp.	10.25	0.75	7.89
NYS	19.75	8.88	Convex Computer	12.63	2.63	26.25
NYS	52.25	29.00	Cray Research Inc.	41.63	4.63	12.50
NYS	22.50	3.75	Data General Corp.	16.13	1.25	8.40
NYS	4.38	1.00	Datapoint Corp.	2.13	-0.13	-5.56
OTC	36.25	15.75	Dell Computer Corp.	28.13	2.63	10.29
NYS	83.00	48.50	Digital Equipment Corp.	57.88	4.00	7.42
NYS	28.88	18.25	Harris Corp.	28.63	4.25	17.44
NYS	56.63	29.88	Hewlett Packard Co.	56.38	2.50	4.64
NYS	139.75	83.50	IBM	90.38	1.00	1.12
OTC	12.00	6.50	Information Int'l	7.75	0.75	10.71
NYS	145.75	105.00	Matsushita Electronics	117.50	8.50	7.80
OTC	20.88	7.63	MIPS Computer Systems	10.00	-0.13	-1.23
OTC	29.50	10.75	Pyramid Technology	13.50	-2.25	-14.29
OTC	19.75	7.50	Sequent Computer Sys.	14.13	1.00	7.62
NYS	48.75	22.25	Silicon Graphics	44.63	-0.63	-1.38
NYS	51.50	20.38	Stratus Computer Inc.	49.25	-1.38	-2.72
OTC	38.63	20.75	Sun Microsystems Inc.	28.13	-0.38	-1.32
NYS	17.63	9.13	Tandem Computers Inc.	11.88	-0.13	-1.04
OTC	4.75	1.25	Tandon Corp.	1.44	-0.06	-4.13
NYS	36.50	23.38	Tandy Corp.	28.38	0.38	1.34
OTC	30.75	9.75	Teradata	30.75	0.13	0.41
NYS	6.13	1.13	Ultimate Corp.	1.63	-0.13	-7.14
NYS	7.00	2.13	Unisys Corp.	4.63	0.38	8.82
ASE	5.75	2.00	Wang Labs Inc. (b)	2.75	0.13	4.76

Software & DP Services — Up 5.89%

Exch	52-Week	Range		Jan. 3 Close	Wk Net Change	Wk Pct Change
OTC	66.50	27.50	Adobe Systems Inc.	66.00	3.25	5.18
OTC	12.25	3.50	Aicorp	7.00	0.50	7.69
OTC	59.88	24.00	Aldus Corp.	42.25	5.75	15.75
OTC	28.50	16.25	American Mgmt. Systems	21.00	1.50	7.69
OTC	17.25	9.00	American Software Inc.	14.88	0.63	4.39
NYS	4.63	1.63	Anacomp Inc.	3.63	-0.13	-3.33
OTC	18.25	11.88	Analysts Int'l	17.50	2.50	16.67
OTC	15.13	4.38	ASK Computer Sys.	14.88	1.75	13.33
NYS	46.00	25.00	Auto Data Processing	44.50	0.63	1.42
OTC	62.25	29.50	Autodesk Inc.	37.25	5.25	16.41
OTC	37.00	19.75	BGS Systems Inc.	37.00	1.00	2.78
OTC	74.75	27.00	BMC Software Inc.	66.75	7.00	11.72
OTC	16.00	8.75	Boole & Babbage Inc.	13.63	-0.13	-0.91
OTC	83.25	27.88	Borland Int'l	83.25	3.25	4.06
OTC	20.88	7.50	Cognos Inc.	13.00	3.00	30.00
NYS	11.63	6.25	Computer Associates	11.63	1.63	16.25
OTC	17.75	7.75	Computer Horizons	9.50	0.50	5.56
NYS	79.25	47.75	Computer Sciences	77.38	-1.88	-2.37
NYS	11.25	7.00	Computer Task Group	8.13	0.63	8.33
OTC	22.75	12.00	Comshare Inc.	14.75	0.25	1.72
OTC	13.25	6.00	Corporate Software	12.75	0.25	2.00
NYS	66.13	35.00	General Motors E (EDS)	64.75	0.13	0.19
OTC	18.75	9.25	Goal Systems Int'l	10.50	1.00	10.53
OTC	7.00	2.06	Hogan Systems Inc.	5.13	0.25	5.13
OTC	29.25	9.13	Information Resources	27.25	3.00	12.37
OTC	15.88	2.63	Informix Corp.	15.50	1.63	11.71
OTC	3.63	1.06	Intellicorp Inc.	1.25	-0.03	-2.42
OTC	31.50	13.00	Intergraph	19.00	0.50	2.70
OTC	10.50	3.00	Interleaf Inc.	7.75	-0.25	-3.13
OTC	18.25	6.88	Intersolv	17.00	1.00	6.25
OTC	43.25	10.50	Knowledgeware Inc.	15.38	3.13	25.51
OTC	45.00	20.25	Legent Corp.	39.50	0.75	1.94
OTC	40.75	14.75	Lotus Development	27.50	3.00	12.24
OTC	19.00	11.50	Mentor Graphics	14.75	-0.25	-1.67
OTC	32.00	9.75	Micrografx	19.75	2.00	11.27
OTC	113.00	48.75	Microsoft Corp.	113.00	2.63	2.38
OTC	16.63	5.50	Oracle Systems	15.25	1.25	8.93
OTC	10.00	2.75	Phoenix Technologies	8.75	0.75	9.38
OTC	23.50	9.00	Platinum Technology	19.50	0.75	4.00
NYS	67.63	39.38	Policy Management Sys.	67.63	3.13	4.84
NYS	37.00	16.00	Reynolds & Reynolds	35.63	-0.88	-2.40
OTC	15.00	6.75	Ross Systems	12.25	0.75	6.52
OTC	27.50	17.75	SEI Corp.	26.25	2.75	11.70
OTC	23.38	13.88	Shared Medical Systems	21.00	1.75	9.09
OTC	35.25	12.50	Software Publishing Corp.	17.13	1.63	10.48
NYS	24.63	7.38	Sterling Software	22.75	-0.50	-2.15
OTC	20.50	9.88	Sungard Data Sys.	18.38	-1.50	-7.55
OTC	43.50	13.00	Symantec Corp.	42.75	0.50	1.18
NYS	15.50	4.63	System Center Inc.	14.00	0.00	0.00
OTC	37.25	12.50	System Software Assoc.	21.75	-0.25	-1.14

Semiconductors — Up 9.92%

Exch	52-Week	Range		Jan. 3 Close	Wk Net Change	Wk Pct Change
NYS	18.25	4.00	Advanced Micro Devices	18.25	1.50	8.96
NYS	12.50	6.50	Analog Devices Inc.	9.88	1.50	17.91
OTC	13.50	6.50	Chips & Technologies	8.38	0.50	6.35
OTC	59.25	38.00	Intel Corp.	50.00	2.50	5.26
NYS	12.50	5.38	LSI Logic Corp.	9.00	1.25	16.13
NYS	19.13	9.50	Micron Technology	15.00	1.00	7.14
NYS	71.25	45.75	Motorola Inc.	65.75	2.25	3.54
NYS	8.38	3.88	National Semiconductor	6.88	0.13	1.85
NYS	47.63	26.00	Texas Instruments	31.50	0.50	1.61
OTC	12.25	4.63	VLSI Technology	8.50	0.63	7.94
OTC	16.75	4.50	Weitek	6.63	1.25	23.26
ASE	6.75	2.00	Western Digital Corp.	3.13	0.50	19.05

Peripherals & Subsystems — Up 6.52%

Exch	52-Week	Range		Jan. 3 Close	Wk Net Change	Wk Pct Change
OTC	2.75	1.00	Apertus Technologies	1.25	0.06	5.22
OTC	17.63	7.50	Banctec Inc.	17.63	1.75	11.02
OTC	32.50	7.25	Cambex Corp.	32.50	3.00	10.17
ASE	11.75	6.50	Cognitronics Corp.	9.63	0.75	8.45
NYS	29.75	12.50	Conner Peripherals	17.75	2.13	13.60
ASE	19.25	7.75	Dataram Corp.	18.00	-0.75	-4.00
NYS	13.13	4.88	EMC Corp.	12.25	0.63	5.38
NYS	49.75	37.63	Eastman Kodak Co.	48.50	2.00	4.30
OTC	11.25	4.75	Emulex Corp.	5.38	0.25	4.88
OTC	24.00	14.75	Evans & Sutherland	20.88	-0.13	-0.60
OTC	9.25	4.00	Iomega Corp.	9.25	0.63	7.25
OTC	28.25	12.75	IPL Systems Inc.	20.50	0.00	0.00
OTC	6.25	1.63	Maxtor Corp.	5.75	0.75	15.00
OTC	18.00	5.50	Micropolis Corp.	9.75	1.00	11.43
NYS	97.50	78.25	3M Corp	95.00	3.88	4.25
OTC	10.75	3.50	Printronix Inc.	3.75	-0.63	-14.29
NYS	26.75	11.25	QMS Inc.	14.25	1.75	14.00
OTC	18.25	8.88	Quantum Corp.	13.00	2.25	20.93
NYS	10.38	4.63	Recognition Equipment	10.00	0.63	6.67
OTC	11.50	4.88	Rexon Inc.	7.00	1.25	21.74
OTC	19.88	7.13	Seagate Technology	10.13	1.00	10.96
NYS	51.50	17.75	Storage Technology	45.75	6.25	15.82
NYS	30.88	16.00	Tektronix Inc.	21.00	2.75	15.07
OTC	0.53	0.16	Televideo Systems	0.16	-0.03	-17.02
NYS	68.75	35.75	Xerox Corp.	67.50	-0.50	-0.74

Leasing Companies — Up 0.43%

Exch	52-Week	Range		Jan. 3 Close	Wk Net Change	Wk Pct Change
OTC	16.25	7.50	Amplicon Inc.	14.13	-0.63	-4.24
NYS	28.38	18.13	Comdisco Inc.	21.25	0.88	4.29
OTC	16.25	10.25	LDI Corporation	15.25	0.25	1.67

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Big Blue gaining in mainframe security

BY MICHAEL ALEXANDER
CW STAFF

Until recently, it took little more than the toss of a coin to decide which of the top mainframe security packages to install. Computer Associates International, Inc.'s ACF2 and Top Secret and IBM's RACF offer similar levels of protection and account for all but a small piece of the market.

However, an informal poll of users — backed by recent market research — suggests that RACF is gaining the upper hand.

Despite unanimous agreement that shifting from one mainframe security package to another is laborious and expensive, users cited various reasons for doing so.

Some said they believed IBM was better equipped to offer security products in a distributed environment that includes a wide variety of platforms and not just mainframes. Others said IBM was probably better able to develop security protection for DB2, its mainframe database. Still others said implementing enhancements to Top Secret and ACF2 was troublesome.

"There is only one reason," said Robert Courtney, a security consultant in Port Ewen, N.Y. "In today's environment, Top Secret is a better package, but IBM is in a better position to adapt to the changing mainframe environment."

The suggestion that there is a shift in security packages in either direction is a "total inaccuracy," according to Ken Farber, research and development consultant at CA.

The primary security concern in today's mainframe environment is the proliferation of platforms and networks over wide geographic areas, he said. Neither CA nor IBM has delivered complete solutions to the problem, Farber added.

However, it appears that the users who switch are not concerned about that. They are either spooked by IBM hints or simply believe IBM will do a better job down the road of addressing various issues.

For example, this month, Charles Schwab & Co. in San Francisco will begin writing conversion routines that will take it to RACF after four years of running Top Secret, said Lloyd Cole, vice president at the Information Services Division of the company. Cole estimated the process will take 12 to 18 months. He declined to say how much the switch will cost.

The lengthy and involved conversion is part of a strategy to move to a distributed computing and management environment, Cole said. "Our feeling, based on talking with CA and IBM, is that we'll be better positioned to move into an [Open Software Foundation Distributed Computing Environment and Distributed Management Environment] with RACF than we would be with Top Secret."

Moving from Top Secret to RACF is "under consideration" at Syntex (U.S.A.), Inc. in Palo Alto, Calif., said Edward Wagner, security manager in corporation information services. The reason is "fear, uncertainty and doubt" about the future, he said.

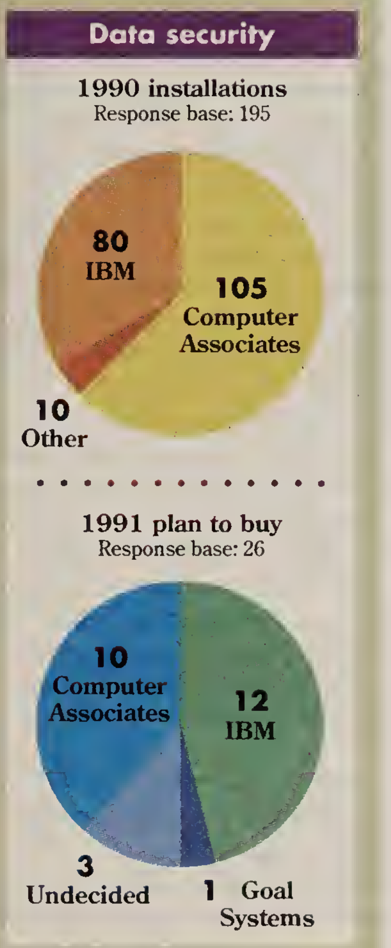
"CA has made major strides down the road to a platform-independent security strategy" and is not likely to trail IBM, countered John Blackley, information security administrator at Capital Holding Corp. in Louisville, Ky., an ACF2 and Top Secret user.

Another reason to shift is that upgrades are difficult to implement, Wagner said, noting that the process is harder for larger installations.

However, some users and experts are baffled by these plans to move, given the similarity of the products and the complexity and cost of converting.

Big two

Securing IBM mainframe sites is predominantly left up to a couple of familiar companies



Source: Sentry Market Research
CW Chart: Marie Haines

IBM moves to bolster portable efforts

BY MICHAEL FITZGERALD
CW STAFF

ARMONK, N.Y. — Users watching IBM's moves in the portable market said the vendor's lackluster history in this arena, coupled with vicious competition, will keep it from making much headway with its planned bevy of new products.

"I'm skeptical; maybe the products will be great, but they'll be too pricey," said Jacqueline Bynsdorp, personal computer coordinator at Jockey International, Inc.

She said Jockey — which is an IBM shop but uses portables from Toshiba America Information Systems, Inc. and NEC Technologies, Inc. — was not likely to buy IBM portables.

Sources said IBM is planning a multifaceted attack that will include the following rollouts:

- An 80M-byte hard drive upgrade for the L40SX, expected this month. One PC director at a major East Coast insurer said his firm has been receiving L40s with 80M-byte drives since last month and has been promised 120M-byte drives before June. Sources close to IBM denied that the firm will ship 120M-byte upgrades for the L40.
- A low-end, 5.5-pound notebook based on the Micro Channel Architecture bus, slated to ship at the end of next month. Similar to IBM Japan's PS/55note but with an internal floppy and a 40M-byte hard drive, this will initially use Intel Corp.'s 16-MHz 80386SX chip.
- A midyear release of a pen-based system that will weigh about five pounds, use a 20-MHz 386SL chip and run Go Corp.'s Penpoint operating system. This is expected to offer four to eight hours of battery life.
- A third-quarter release of an active-matrix color laptop that will use IBM's 386SLC power management chip and a nickel-metal hydride battery, which will give it two hours of battery life.
- A fourth-quarter release of a sub-6-pound color notebook with a passive-matrix screen.

The bottom line, though, according to analysts, is that heavy IBM users will buy, and others will probably just kick tires.

"They'll sell these products into true Blue accounts, and if that's all they do, they'll get something like 8% of the market, and that's not bad," said Andrew M. Seybold, editor in chief at the "Outlook on Professional Computing," a newsletter in San Jose, Calif.

NEWS SHORTS

HP embraces Token Ring

Hewlett-Packard Co. took strides last week to improve the ability of its Unix-based reduced instruction set computing (RISC) systems to connect to IBM Token Ring networks. A longtime Ethernet stalwart, HP has announced support for the industry-standard Token Ring protocol with an adapter card for all HP RISC computers. The company will be reselling Madge Networks, Inc.'s Madge Smart 16/4 Extended Industry Standard Architecture Ringnode as a Token Ring network card. Ranging in price from $1,295 to $2,895 (depending on system size), the cards will be available this month for the Series 800 midrange RISC systems, in March for the Series 700 workstations and toward midyear for the HP 3000 Model 900s.

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Seagate loses ground in IBM suit

A federal judge in Minneapolis has granted IBM a preliminary injunction in its suit over high-tech trade secrets filed in October against Seagate Technology, Inc. and a former IBM product development manager. Both Seagate and former IBMer Peter I. Bonyhard have been enjoined from "using or disclosing" technology that Bonyhard helped develop at IBM. Bonyhard is also prohibited from taking any position at Seagate that would involve him in the development, design or manufacture of products involving IBM's technology.

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United Telecom completes buyout

United Telecommunications, Inc. is acting on its option to buy the remaining 19.9% of U.S. Sprint Communications Co. from GTE Corp. The $530 million transaction should be completed by Jan. 31. United Telecom merged its telecom services with GTE's Sprint and Telenet subsidiaries five years ago; United Telecom purchased a controlling interest in Sprint two years ago, with an option to purchase the rest by 1995.

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DEC slapped with $2.5 million fine

The U.S. Commerce Department levied a $2.4 million fine against Digital Equipment Corp., saying the company violated export regulations in 31 instances between 1986 and 1989. According to spokesman Mark Fredrickson, the fines stemmed from allegations that DEC shipped products worth $19 million prior to receiving appropriate export licenses. He said the employees responsible are no longer at the company and that the shipments in question were not sent to any countries that were deemed a security threat.

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Justice security lapses rapped

A report released last week by the U.S. House of Representatives' Government Operations Committee said the U.S. Department of Justice has failed to conduct risk analyses, develop contingency plans and conduct adequate security training. The department has made some security improvements but still fails to meet the requirements of federal law, according to the report.

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Wang fattens its wallet

Wang Laboratories, Inc. is about to add $11 million to its balance sheet from the sale of its Network Services Group to the UK's Cable & Wireless PLC. Wang is selling the 7-year-old unit, which provides wide-area network services, because it no longer fits the company's strategy, a Wang spokesman said. Network Services will remain in Lowell, Mass.

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Northgate expands distribution

Northgate Computer Systems, Inc. moved beyond mail order last week by forming a new division that moves the Minneapolis-based company into such distribution channels as dealers, value-added resellers (VAR) and systems integrators. The company is actively recruiting dealers and VARs to carry its Intel Corp. 80386 and I486 line of personal computers. It predicts business partnerships by midyear.

U.S. sees industry growth in '92

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Despite predicting a sluggish economy, the U.S. Department of Commerce expects that 1992 sales of computer hardware will produce the first real growth in four years, while revenue from computer software and services will continue to rise at double-digit rates.

Moreover, information services topped the agency's list of fastest growing service sectors.

Rose-colored glasses?

Recession aside, the U.S. government is predicting fairly strong growth for the domestic information technology industry

	1991	1992	Percent increase
Electronic information services	$10.2	$12.2	19.6%
Data processing and network services	$35.6	$40.4	13.5%
Computer professional services	$49.4	$56.3	13.9%
Computer hardware and peripherals	$53.6	$55.8	4.1%
Packaged software	$20.3	$23.2	14.3%

(Dollars are in billions, not adjusted for inflation)

Source: U.S. Department of Commerce

CW Chart: Marie Haines

Similar good tidings for the computer industry come courtesy of Standard & Poor's Corp.'s annual overview of how various industries will fare in the coming year. Standard & Poor's said it expects the operating profits of computer manufacturers to jump 12% this year, after sliding 2% in 1991. Computer analyst Lawrence Freitag said the increase will come from an improved world economy, recent industry cost-cutting and restructuring and new product introductions.

In its annual analysis of 350 industries, the Commerce Department said the value of U.S. hardware shipments worldwide will grow 4% this year, following an estimated decline of 2.2% last year and 0.1% in 1990.

"While [4% is] a moderate growth rate . . . it marks the first positive growth since shipments peaked in 1988," said J. Michael Farren, the Commerce Department's undersecretary for international trade.

However, the anticipated rise in sales will not forestall a total computer industry employment drop from 235,000 to 225,000, following a decline of 15,000 workers last year, the agency said. And despite the bullish sales forecasts, Freitag said computer companies will continue to find themselves locked in a profits squeeze.

Despite the expected sales growth and a forecast increase in exports, the Commerce Department said imports will grow faster, leading to a computer trade deficit of $1.5 billion this year, after a near balance of trade in 1991.

The expected strong performance for the computer industry is based in part on an assumption that the economy here and abroad will grow this year, improving in real terms of 3% in the U.S., the agency said.

The report also said the industry is going into 1992 with substantially lower inventories than in 1991, with more new products scheduled for introduction and with the likelihood of the release of some pent-up demand from users who have been sitting on their information systems wallets for two years.

Tempering optimism

But the Achilles' heel of the Commerce Department projections may be the underlying assumption about the overall economy, developed last July — a projection some economists and users now see as optimistic.

Tim Jackelen, MIS director at Northrup King Co., a Minneapolis-area farm supply company, said his firm would not be a big IS spender this year because it made major investments in new systems last year. But he said he expects IS spending in his area to rebound this year as the manufacturing economy improves.

Tim Miles, a senior analyst at the Commerce Department's Office of Computers and Business Equipment, acknowledged that the forecasts were put together at a time when there was more optimism about the economic recovery. "We still expect the spending on workstations, PCs and portables will be fairly good. The big question is what's going to happen to the big-ticket items like mainframes. The [5% growth estimate] for mainframes may be somewhat optimistic," he said.

As for information services, the forecast said despite heady growth projections, U.S. providers face aggressive new competition from Europe and Japan, as well as considerable uncertainty over possible government actions on issues of privacy and intellectual property protection.

Revenue growth in data processing and networking services will be fueled in part by a continuing trend toward outsourcing, the report said. Expenditures on electronic data interchange will also drive growth.

OS/2, SAA will be 'out,' Windows 'in' this year

BY KIM S. NASH
CW STAFF

FRAMINGHAM, Mass. — Would-be Nostradami from Technology Investment Strategies Corp. (TISC) took their shots at predicting what 1992 holds for the computer industry, but mostly they played it safe, echoing forecasts from previous years.

General themes for '92 included such proclamations as proprietary systems dying while end users grab power from data center managers. TISC Vice President Frank Gens, however, last week outlined tangibles that take the hollowness out of those refrains.

Among other predictions, TISC, based here, went out on the following limbs:

- **No more OS/2.** IBM may have pushed OS/2 2.0 out the door before Microsoft Corp.'s Windows New Technology (NT), but the few-months lead does not guarantee success, according to Gens.

IBM made good on its word to ship its 32-bit desktop operating system by year's end. But this means little compared with the huge installed base of Windows users, Gens said.

"Users are just plain tired of waiting for OS/2, so NT will surge right past OS/2 by year's end," Gens predicted.

- **Bye-bye Banyan.** The merger of Microsoft and Banyan Systems, Inc. would make good sense, Gens said. Banyan's Vines, which he called a sound network operating system, could bolster Microsoft's showing in that arena, where LAN Manager is a "fairly weak" product.
- **R.I.P. SAA.** Systems Application Architecture (SAA) will meet with a wrenching demise in '92.

If IBM has any sense at all, it will face marketplace reality and redesign SAA to incorporate multivendor standards, not just "what IBM calls 'standard,' " Gens said.

In its current incarnation, SAA is a mix of open and proprietary interfaces. An architecture called SAA will likely survive 1992, but it will be nothing like what is now available, Gens predicted. "Proprietary interfaces such as CICS and IBM's own SQL will take a back seat" to more standardized terms, he added.

- **Users unite.** Sure, observers have long predicted that users will band together and stand as a single mighty force against domineering vendors, but it is real this time, Gens said. Vertical market-based user groups have sprung up in the last year, spelling out open systems rules for vendors to follow.
- **ACE in the hole — a 6-ft trench, to be exact.** In-fighting among key members of the Advanced Computing Environment (ACE) consortium about who is doing what and how well will implode the group, according to Gens.

Mips Computer Systems, Inc. and The Santa Cruz Operation are already pointing fingers, each claiming the other is dragging out product delivery by being late with key components. Meanwhile, Microsoft and Digital Equipment Corp. are laying groundwork for their own separate stabs at the reduced instruction set computing market.

"None of these vendors is standing still, but ACE is," Gens said.

Plans reveal wider options

CONTINUED FROM PAGE 1

"I'm committed to doing some experimentation this year with Unix-based open systems."

Paul Prutzman, director of computing and customer services at Air Products & Chemicals Co. in Allentown, Pa., forecast "a slack-off in growth, but not a decline," in his company's use of mainframe millions of instructions per second during 1992.

Prutzman said he will concentrate on "de-bottlenecking" the mainframe by adding storage and memory to complement the IBM 3090 400E his shop purchased in April 1991. Air Products will likely buy an S- or J-class model on the used equipment market late this year or early next, Prutzman said.

"I think everyone's more aware of alternatives and the redistribution of computing work loads. I view that as a kind of rebalancing. But you can't dismiss overnight what it took 25 years to build," said Elaine R. Bond, senior vice president at Chase Manhattan Corp.'s Corporate Systems Group.

The philosophy in many large shops for the 1990s appears to translate "let the application dictate the platform but do not throw out what already exists."

This viewpoint may be embraced out of necessity by users unwilling to take risks with what passes for open systems today. "I wish that the sellers of open systems would get their act together and deliver usable products rather than get my appetite all ready for futures," Moore said.

Henry Hamilton, senior vice president of IS services at Shearson Lehman Brothers, Inc. is working on all fronts. "We're bringing users closer to technology with cooperative processing and LAN servers. It's a matter of where the technology is best suited," he said.

Prutzman may buy *a used S- or J-class model*

Stephen Josselyn, a senior analyst at International Data Corp. in Framingham, Mass., said preliminary forecasts point to a 3% growth in mainframe revenue this year.

"Last year turned out to be a worse year than we thought for mainframes because IBM was not shipping their new models," Josselyn said. "If one year is down, it's easier to get growth the next year. And the economy and [information technology] spending will be up slightly in 1992." (See story above.) Additionally, Amdahl Corp. and Hitachi Data Systems Corp. will ship their high-end mainframe families during 1992, adding fuel to an already competitive fire.

Users are changing their mainframe purchase plans somewhat. Instead of buying several machines for dedicated tasks such as production and testing, users will buy one huge computer that can be partitioned, said Susan Gannon, a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass.

Peter Tarrant, IBM's director of enterprise systems marketing, said he believes the mainframe's changing role "is where the biggest growth is." Customers want to take their current functions and share work, to extend the range and reach of work loads as opposed to simply processing applications more efficiently.

String of delays stalls Windows 3.1

CONTINUED FROM PAGE 1

mation systems strategies. "We've got several sites waiting to move over to Windows, but they've held back because Version 3.1 is always just around the corner, and it's supposed to be quicker and better than what's out there now," said Steve Birgfeld, a manager of computing standards at Martin Marietta Corp.'s IS group in Chantilly, Va. Birgfeld has worked with several beta-test versions of the impending update. Even so, he said, he has heard no "official reason" why 3.1 has not shipped yet, and "that's a bit puzzling."

Early delays in Version 3.1 were attributed to both difficulties with the new Truetype outline font technology and bugs in the shell of the interface, according to Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash. These have since been ironed out.

Another beta-test version contained problems with certain Version 3.0 components such as memory mangers and was reportedly incompatible with DOS extender applications adhering to the DOS Protected Mode standard. Cameron Myhrvold, manager of Microsoft's developer relations group, said he expects that problem to be cleared up by the time Version 3.1 is released.

The delay in the arrival of Windows 3.1 has also proven irksome for developers who are writing pen-based applications based on the Windows for Pen Computing platform, which will be an integral part of the 3.1 update. "We wish Penwindows was ready because we're ready to ship [applications]. This is the first time applications are ready before the hardware or OS software is," said Vern Rayburn, chairman of Slate Corp. in Scottsdale, Ariz.

The waiting game

Some observers suggested that 3.1 is ready but that Microsoft is waiting for developers to build up a suite of applications optimized for the revamped environment.

At a Windows 3.1 software developers conference in August, Microsoft officials offered a sneak peek at the update. It included a series of built-in diagnostic checks and balances that Microsoft hoped will lure developers into aggressively building new applications for it.

"Microsoft is at the mercy of 3,500 commercial developers," said Joel Diamond, technical director of the Windows User Group Network in Media, Pa.

"It takes a minimum of six months of developing and compatibility testing when you're dealing with new [application programming interfaces] and font specifications. A solid environment will also reduce technical support. No one wants to give money away to the post office for update diskettes," Diamond added.

Observers said Microsoft is going to great lengths to ensure that the upgrade is as bulletproof as possible when it ships later this year. Windows 3.1 is now at 10,000 beta-test sites, surpassing even the mammoth beta-test program of DOS 5.0.

Microsoft has also acknowledged that many of the problems users have today with setup and memory management can be avoided through better Windows documentation and installation programs.

IBM struggles, hits target

CONTINUED FROM PAGE 1

October 1991 for delivery by year's end, was provided electronically to about 350 accounts worldwide, said Tommy Steele, director of the IBM Personal Systems Programming Laboratory in Boca Raton, Fla. He said IBM will begin delivering a shrink-wrapped version of the release by midmonth.

IBM had plenty riding on this shipment. Last October, the company promised a limited-availability version by year's end after postponing the full-blown Release 2.0 to March.

The limited-availability version includes everything IBM promised users at an April OS/2 conference. The March release will include changes suggested by beta testers.

"It was an important date," said Bill Higgs, vice president of software research at Computer Intelligence/Infocorp. "If they had not shipped this part by the end of the year, there would have been a major credibility gap."

Higgs added that this shipment does not guarantee that IBM will deliver the complete Release 2.0 on schedule in March, but "it gives you a more comfortable feeling."

The limited availability version is stabilized code with essentially the same functionality as the existing Release 2.0 beta code. It does not have the seamless support of Microsoft Corp. Windows applications, nor does it support a 32-bit graphics engine. Both functions have been promised for the full-blown version of 2.0, now scheduled for a March shipment.

IBM's Steele said the company received orders from about 350 accounts worldwide for the limited availability version.

Customers had to meet certain requirements to receive this release, including a commitment to implement the full-blown Release 2.0. Customers were also required to indicate they needed the software for a production application and to prove they had the necessary technical support in-house to handle it.

In the works

Royal Bank said it had been planning to install this release because it had scheduled delivery of applications to its users based on the year-end availability date for Release 2.0.

Royal Bank's Oliver said he had been working closely with IBM over the past two weeks to "make sure it had the kinks out."

Carey Serif, manager of applied technology at Huntington National Bank, said he elected not to take the limited-availability version because "we were not quite in the crunch that some other people were, so we didn't really need it."

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Users must look 'within' for enhancements to Windows

BY JAMES DALY
CW STAFF

While the arrival date of Windows 3.1 remains hazy, some of the improvements are certain. But "most of the enhancements are internal," according to beta tester John Stingl, office automation manager at Pacific First Bank in Seattle. These include the following:

- Dr. Watson, a set of diagnostic tools designed to pinpoint the source of the persistent Unrecoverable Application Error crashes that have plagued many Microsoft Corp. Windows 3.0 software packages.
- Truetype, which has been jointly developed by Microsoft and Apple Computer, Inc., will be incorporated directly into the Windows Graphics Device Interface. Truetype will allow users to scale, rotate and otherwise manipulate fonts.
- Support for the pen-based Windows for Pen Computing package, as well as a feature called Common Dialogue, which contains a set of commonly used dialog boxes that developers can pop in their applications, and an improved help facility.
- Enhanced multimedia.
- New application programming interfaces.
- A new file manager that lets the user split the screen vertically to show a directory tree on the left and files in the selected directory on the right. The program manager will also let the user specify a set of "start-up" applications that will automatically be available in an icon form.
- Greater application integration, including Dynamic Data Exchange, Object Linking and Embedding and drag-and-drop features.

Hewlett-Packard succeeds in slipping under $5,000

CONTINUED FROM PAGE 1

"That's quite awesome for that price range," observed another analyst who listened in on the briefing. A similarly priced workstation from Sun Microsystems, Inc., for example, runs at 20.1 Specmarks.

The HP offering will undoubtedly shake the trees at Sun and Digital Equipment Corp. Both vendors have similarly low-priced systems in the $5,000 range, but they run at significantly lower performance levels than the HP system will deliver, analysts noted.

Closer to the $10,000 mark, HP will also announce the Model 710 Bushmaster, a high-performance workstation available in both color and gray-scale versions, sources said. HP will also introduce improved three-dimensional solid modeling products integrated with the Precision Architecture RISC chip. Users of current Series 700 workstations can upgrade their systems with the 3-D graphics boards.

"HP has done a good job. You have to give them credit," said Duane Elms, a program manager in technical computing at General Electric Co. in Bridgeport, Conn. "Two years ago, I wouldn't have put a dime in their stuff, and now they're very impressive."

The appearance of an HP workstation at less than $5,000 is surprising in light of remarks a company vice president made last month after DEC's low-end workstation announcement. Lewis Platt, an HP executive vice president and head of the computer systems organization, said his company would not reach as low as $4,000 to $5,000 with its upcoming low-end models. Apparently what has changed is HP's ability to deliver the Model 705 earlier than expected, sources close to the company said. "Customers have been asking for it, so the strategy didn't change. The timing did," the source said.

Compatible partners

Analysts noted how the addition of competitively priced low-end machines to the Precision Architecture RISC line gives HP a binary compatible reach from the desktop to mainframe-class systems — an attractive lure for corporate accounts.

"HP has clearly recognized that while the high end is an interesting place to be, they can see the way the workstation business is going," said Laura Conigliaro, an analyst at Prudential Securities Research in New York. She pointed to HP's success of the Model 720, its current low-end workstation with a base price of about $12,000 for 59.5 Specmarks.

In the past, HP has been excluded from some accounts because of its segmented product line, which includes its own proprietary MPE architecture, the Series 400 workstations based on Motorola, Inc.'s 68040 chip, and the Precision Architecture RISC products.

W.Y.S.I.W.Y.G.

Illustration by Juan Thomassie

PLAY IT AGAIN, RAM

Having problems finding those computer-generated tunes you've been yearning for? Search no longer; there's a catalog, called *Aftertouch: Electronic Music Discoveries*, filled with jazz, rock, easy listening and new age music, all done with keyboards — computer, that is. Titles include "Console Cowboy," "Technocrat," "Mac & Me" and "Terminal Insecurity." Catalog published by the Computer Musician Coalition in Peoria, Ill.

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Nit-Pick

The Pick system was not always known by that name. It started its life in 1965 at the U.S. Army as Girls — Generalized Information Retrieval Language and System. The brainchild of Richard Pick and Don Nelson, Girls evolved into the Pick system by 1972, when Mr. Pick refined the system for general business use and formed his own company.

FOREIGN EXCHANGE

Business overseas? Here's how they say it in other countries:

database	**(English)**
datenbasis	**(German)**
base de datos	**(Spanish)**
base de donnees	**(French)**
benchmark	**(English)**
fixpunkt	**(German)**
referencia	**(Spanish)**
repere	**(French)**

CIO's Top 10 concerns in 1992

According to N. Dean Meyer, president of NDMA, Inc., a consulting firm in Ridgefield, Conn., the important issues for CIOs in '92 will revolve around the organizational structure of IS, internal economics and business practices:

1. Set budgets based on business need, not politics.
2. Involve clients in priority-setting processes that ensure alignment with the business.
3. Bring entrepreneurship and customer focus to the IS culture.
4. Provide a range of technical specialists without adding head count by using contractors.
5. Build high-performance teamwork between various IS specialists.
6. Measure the strategic benefit of IS in quantitative terms.
7. Look for high-payoff, quick-hit opportunities instead of large, complex projects.
8. Conduct architecture planning as an ongoing process.
9. Consolidate operations to reduce costs.
10. Develop collaborative relationships with decentralized IS groups throughout the company.

▶ Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

INSIDE LINES

Sharpening the blade

▶ A leaner, meaner Lotus is beginning to take shape as the company starts implementing the 300- to 400-person layoff announced last month. As expected, marketing will take a substantial hit — particularly staff/planning functions, according to Robert K. Weiler, department head. The downsizing will "prune a seriously overgrown department," he said.

Faults not tolerated

▶ Stratus Computer and Hewlett-Packard are reportedly engaged in discussions about a partnership whereby HP would resell Stratus' line of fault-tolerant computers. While the Stratus response was "no comment," and HP could not be reached by press time, such a liaison could pose an interesting situation, as HP currently remarkets Sequoia Systems' fault-tolerant systems. HP is said to be unhappy with the way the Sequoia agreement is evolving.

Black and Blue?

▶ IBM is apparently going all out to prove it has changed its ways in the world of portables. Sources say its new line of portables will be in black casing, a distinct move away from the beige coloring the company has had before. "Beige is not a good color for portable computing anyhow," one source said. "It gets dirty." One source reports that the move to a new color has sparked an internal debate at IBM, and there is a chance that the company will decide the new look is too different and dump it.

But is he happy?

▶ Last week's uptick in the price of Microsoft's stock, bringing it to a 12-month high of $114 a share, made Chairman Bill Gates the richest man in America, industry analysts estimate. The 36-year-old entrepreneur is said to be worth approximately $6.5 billion, earning him the No. 1 spot previously held by Wal-Mart Stores head Sam Walton.

Who's on top?

▶ Ungermann-Bass and Networth seem to have their signals crossed about exactly how big a piece of the LAN hub vendor UB has bought. A Networth spokesman said 50%; a UB spokeswoman claimed 50.1%. That 0.1% may be small, but it does make a slight difference in terms of UB's having a controlling interest in a company that is, among other things, giving Novell a run for its money in the Netware management arena.

When splitting is good news

▶ Novell is rumored to be preparing to split its stock now that it has vaulted above $60 a share. The darling of Wall Street is gaining ground even compared with the recent record-breaking run-up on the stock market. Novell denies any plans to split its stock in the near future — the next two weeks, that is. No promises after that, a spokesperson said.

Putting pen to screen

▶ IBM's collaborative efforts with Go Corp. will yield a tablet machine that will sport a pen-based version of IBM's Presentation Manager. Data can be entered via a stylus, and overlapping documents can be moved around the screen by dragging them with a fingertip. The machine will also offer voice annotation capabilities. Chairman Michael Dell says Dell Computer also plans a product using pen-input technology by next year.

Prodigy users trying to log on to the on-line system may have had some problems getting through to their local access numbers over the holidays. According to a Prodigy spokeswoman, the Christmas season made things "hectic," as scores of new users, eager to try out Prodigy software received as a gift, spent hours on the system familiarizing themselves with it. The result was that regular users found it difficult to get through. Things should return to normal after the holiday season, however, the spokeswoman said.

Things are back to normal for News Editor Alan Alper — he's looking for news tips. Phone him at (800) 343-6474, fax him at (508) 875-8931, or Compuserve him at 76537,2413.

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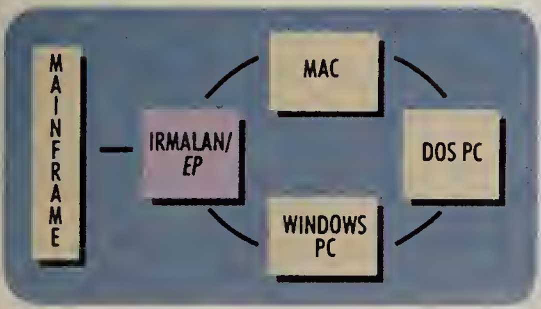

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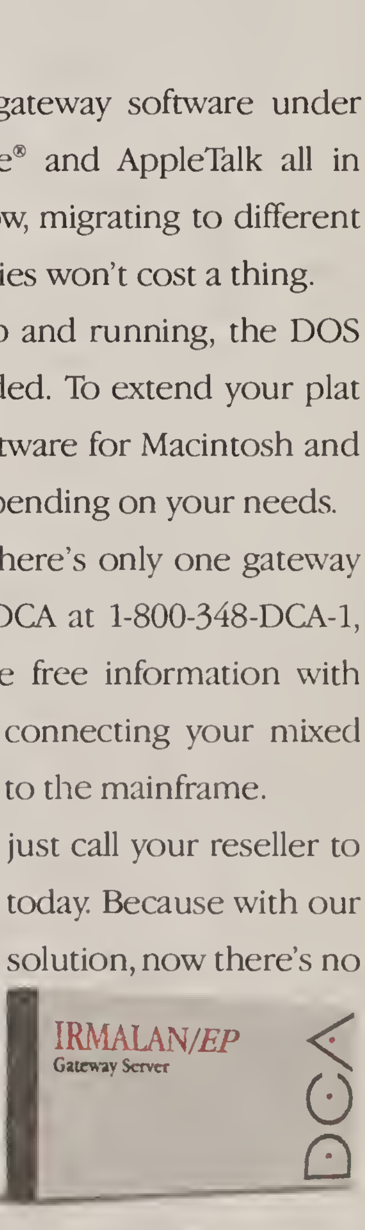

*Windows client software is not yet available for the Novell IPX/SPX protocol. ©1991 Digital Communications Associates, Inc. All rights reserved. DCA is a registered trademark and IRMALAN, MacIRMALAN, IRMA, and RamXpander are trademarks of Digital Communications Associates, Inc. All other brand and product names are trademarks or registered trademarks of their respective owner.

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